# 2008 Sustainable Development Report

ONTARIO POWER GENERATION

▲ Abitibi Canyon GS

## Table of Contents


3 2008 Performance Highlights

5 Message from the President of OPG and the VP of Sustainable Development

8 Environmental Performance

22 Social Performance

30 Economic Performance

36 Appendices A and B

43 The Environmental Policy

# 2008 Performance Highlights

Ontario Power Generation defines sustainable development as "embracing business strategies and activities that meet the needs of the enterprise and its stakeholders today, while protecting and enhancing the human and natural resources that will be needed in the future."

## OPG's Sustainable Development Performance Highlights for 2008 Included:

- Approximately 78 per cent of OPG's electricity production was derived from hydroelectric and nuclear sources that were virtually free of air emissions causing smog, acid rain and global warming.
- Approximately 600 employees from across OPG received sustainable development training, for total training of 4,000 employees to date.
- OPG's Corporate Citizenship Program provided support to almost 1,000 registered charitable and non-profit initiatives including scholarships and student awards.
- The total acid gas emission rate of 4.53 grams/kWh was OPG's lowest ever and was 25 per cent lower than it was during OPG's inception ten years previously. Additionally, low emission rates and lower generation helped the fossil plants achieve the lowest acid gas emissions in the past 25 years.
- Biomass test burns at Atikokan GS, Nanticoke GS and Lambton GS, taken altogether, produced more than seven million kilowatt hours of electricity, enough to power more than 500 homes for a year and displace 7,000 tonnes of $CO_2$ emissions.
- As a result of lower production from our fossil plants in 2008, OPG's total $CO_2$ emissions declined relative to 2007. Notably, $CO_2$ emissions were lower than they were in 1990 - the base year for the Kyoto Protocol.
- In partnership with TransCanada Energy, OPG completed the first phase of the 550 MW Portlands Energy Centre – online, on time and on budget.
- OPG won two prestigious environmental awards based on our biodiversity efforts: International Conservation Award - Corporate Habitat of the Year (Darlington GS), and Wings over Wetlands Award.
- Hydroelectric runner upgrades saved 13.8 GWh - enough energy to power about 1,400 households for one year.
- The Accident Severity Rate performance was the best in OPG's history at 1.47 days lost per 200,000 hours worked. The All Injury Rate (AIR) was 1.15 injuries per 200,000 hours worked. While slightly below the company's 2007 performance, this was still the second best AIR in OPG's history.
- OPG signed a historic partnership agreement with the Lac Seul First Nation. This agreement sees Lac Seul First Nation owning a 25 per cent equity stake in the new Lac Seul GS, also known by its Ojibway name, as Obishikokaang Waasiganikewigamig GS.
- From June through August, Fossil's Forced Outage Rate – a key reliability measure – was under eight per cent. This was a 30 per cent improvement over the same period in 2007.

## OPG's Sustainable Development Challenges for 2008 Included:

- The Environmental Performance Index decreased slightly relative to 2007 – the reduction was due in part to higher $NO_x$ emission rates and slightly elevated tritium emissions.
- Although total $CO_2$ emissions declined in 2008 relative to 2007, the $CO_2$ emission rate was slightly elevated.

# Company Profile

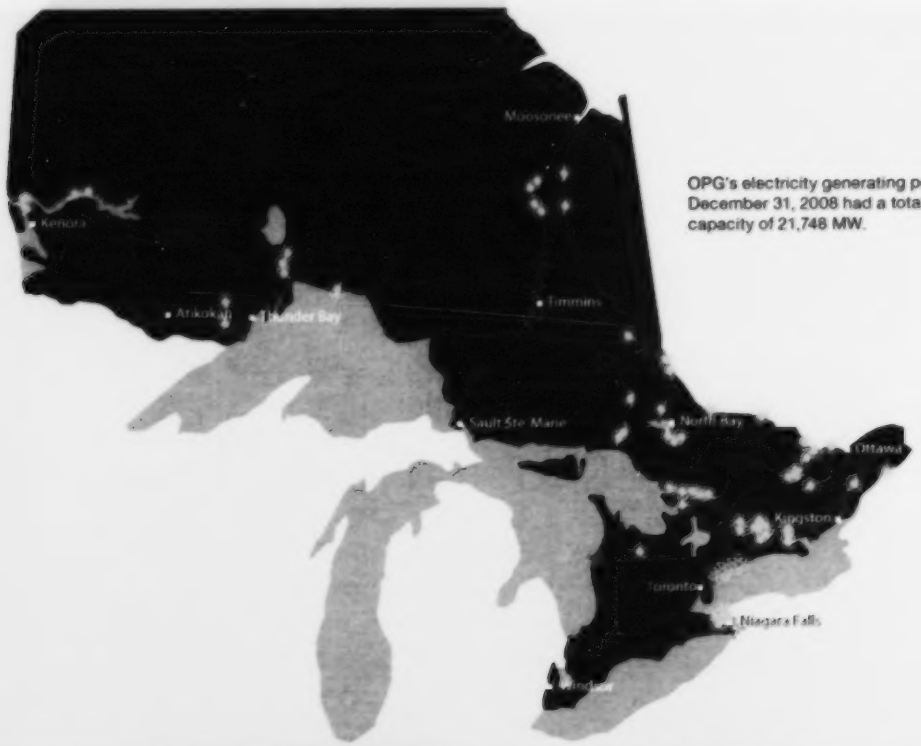
OPG is an Ontario-based electricity generation company whose principal business is the generation and sale of electricity in Ontario. OPG's focus is on the efficient production and sale of electricity from its generating assets, while operating in a safe, open and environmentally responsible manner. OPG was established under the Business Corporations Act (Ontario) and is wholly owned by the Province of Ontario.

In 2008, OPG had approximately 12,000 regular employees and generated 107.8 terawatt hours (TWh) of electricity.

OPG's electricity generating portfolio as of December 31, 2008, had a total in-service capacity of 21,748 megawatts (MW), which consisted of:

- three nuclear generating stations with a capacity of 6,606 MW
- five fossil-fuelled generating stations with a capacity of 8,177 MW
- 64 hydroelectric generating stations with a capacity of 6,963 MW, and
- two wind power turbines with a capacity of 2 MW.

In addition, OPG and TransCanada Energy Ltd. co-own the Portlands Energy Centre gas-fired generating station. OPG, ATCO Power Canada Ltd. and ATCO Resources Ltd. co-own the Brighton Beach gas-fired generating station. OPG also owns two other nuclear generating stations, which are leased on a long-term basis to Bruce Power L.P. ("Bruce Power").




**OPG's electricity generating portfolio as of December 31, 2008 had a total in-service capacity of 21,748 MW.**

| 3 | 5 | 2 | 64 | 2 | 3 |
|---|---|---|---|---|---|
| Nuclear Stations | Fossil-Fuelled Stations | Co-owned Gas-Fired Stations* | Hydroelectric Stations** | Wind Power Turbines | New Generation Projects*** |

* The 550 MW Portlands Energy Centre gas-fired generating station in Toronto co-owned by OPG and TransCanada Energy Ltd.) and the 560 MW Brighton Beach gas-fired generating station, co-owned by OPG, ATCO Power Canada Ltd. and ATCO Resources Ltd.

** Includes four hydroelectric stations in northeastern Ontario under redevelopment (Wawatin, Sandy Falls, Lower Sturgeon, and Hound Chute).

*** Consists of three hydroelectric projects – the Lac Seul generating station in northwestern Ontario (in service, February 2009), the Niagara Tunnel, near Niagara Falls, and the Upper Mattagami-Hound Chute redevelopment in northeastern Ontario, consisting of the Wawatin, Sandy Falls, Lower Sturgeon, and Hound Chute generating stations.

# Message from the President of OPG and the Vice President of Sustainable Development

OPG made steady progress in its sustainable development performance in 2008. Like our previous reports, this report documents and measures that performance with respect to three areas -- the environment; social impact; and economic contribution. This is our 10th Report to date. While we are proud of the many achievements it describes, we are aware that we can always do better and we are committed to improving our performance wherever possible.

## ENVIRONMENTAL PERFORMANCE

Our environmental performance was better than target in a number of key benchmark areas – including spills, regulatory compliance, energy efficiency and the testing and use of carbon-neutral biomass fuel. While not all air emission targets were met, OPG's environmental performance was strong overall.

In addition to performing well in our key benchmark areas, OPG also continued to build on and expand its many biodiversity activities – including our extensive tree planting program, our water management initiatives, and our habitat management efforts in areas surrounding our generating facilities. OPG's biodiversity contribution was recognized in 2008 by two notable awards: Corporate Habitat of the Year and Wings Over Wetlands.

## SOCIAL PERFORMANCE

Our social performance embraces areas such as safety and corporate citizenship, and includes our performance as a responsible employer. Safety is the fundamental value at OPG and our workplace safety performance was strong in 2008 in terms of our Accident Severity Rate and All Injury Rate. We are not complacent, however. We continued to have challenges in some of our safety results and we are focused on ways to improve our performance.

With respect to communities, we have made good progress in building strong, mutually respectful relationships with many Ontario First Nations. The commitment of our employees to charity and our host communities also continued in full force in 2008 – as evidenced by the strong response they gave to our annual Charity Campaign and their many acts of community volunteerism. We were also proud to be again recognized as one of the top employers in Canada and in the Greater Toronto Area. One of our goals as an employer is to attract the best and brightest people to OPG. In 2008, we hired nearly 800 new employees, over 300 of whom are engineers and technicians. These and other aspects of our social performance are outlined in this Report.

## ECONOMIC CONTRIBUTION

In 2008, OPG contributed substantially to Ontario's economy. OPG is committed to Ontario. Every dollar we earn ultimately benefits Ontario. Our investments are made in Ontario. Our 12,000 employees and all our facilities are located in Ontario. All the taxes and payments we make stay in Ontario. As our Report makes clear, we are an Ontario focused company committed to improving – through our significant economic contribution -- the quality of life for all Ontarians, their families and communities.

## OPG'S COMMITMENT TO SUSTAINABLE DEVELOPMENT

OPG's goal for the future is to be recognized as a leading clean energy company that will play a major role in leading Ontario's transition to a more sustainable energy future. At present, almost two-thirds of OPG's generation portfolio consists of nuclear and hydroelectric sources. These generation sources produce virtually no emissions that contribute to smog or climate change.

Going forward, OPG will strengthen its commitment to clean generation. We have been selected to operate two new nuclear reactors at our Darlington site. We are developing new hydroelectric supply in northern Ontario. We are exploring the use of biomass at our coal-fired stations; and we are

implementing the Ontario government's directive to phase out the burning of coal at our coal-fired stations by the end of 2014. These and other initiatives -- many of which are described in detail in this Report -- will help us achieve our goal.

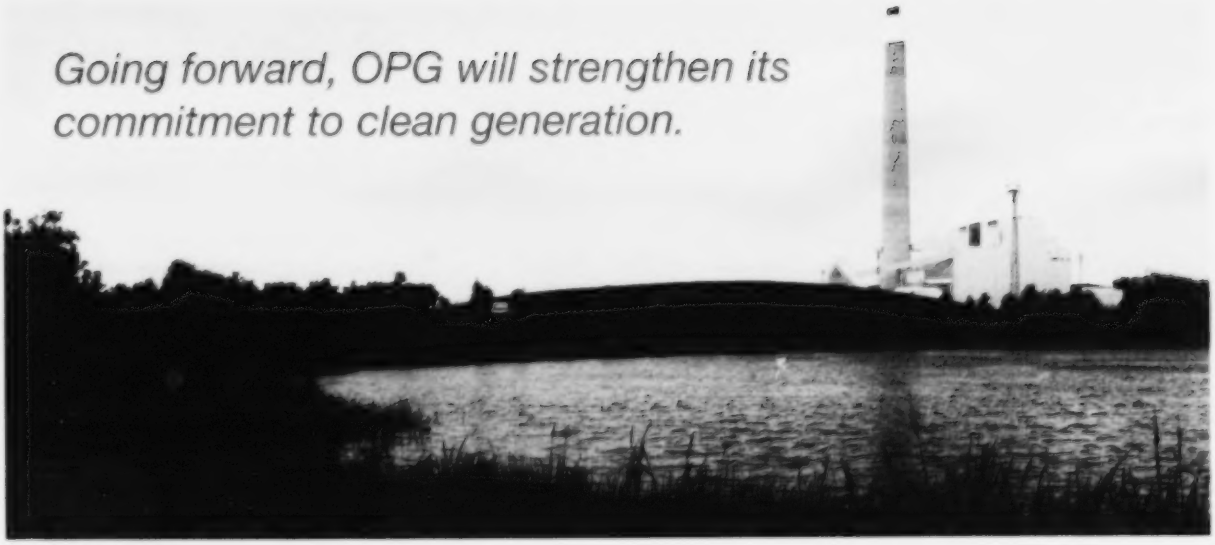
Our 2008 Sustainable Development Report reflects our focus on helping to make Ontario a better place for everyone -- environmentally, socially and economically. While our performance can be improved in some areas, we are proud of the many accomplishments documented in this Report and encourage you to review it as a way to assess and measure our progress.

If you have any questions, please contact us. Contact information is available on OPG's website – **opg.com** -- and on the back cover of this report.

Jim Hankinson
President and CEO

Cara Clairman
Vice President
Sustainable Development

*Going forward, OPG will strengthen its commitment to clean generation.*



▲ Thunder Bay GS

# Accountability

OPG's President is accountable to the Board of Directors for making certain the company manages the environmental, social and economic aspects of its business in a manner consistent with OPG's Environmental Policy and Code of Conduct.

Site environmental and community advisors, working in collaboration with the Corporate Sustainable Development Group, are responsible for a variety of stewardship initiatives (described throughout this report) and sustainable development activities that take place across OPG's operations.

To ensure that OPG employees remain "ahead-of-the-curve" in the area of sustainable development, in 2008 the company continued a program initiated in 2003, requiring new supervisors and managers to participate in training entitled "Sustainable Development at OPG: Our Commitment to the Environment, Society and Economy". The purpose of this training, which is ongoing, is to ensure that supervisors and managers can advise employees under their direction of the need and means to operationalize sustainable development on a daily basis. In 2008, approximately 600 employees from across OPG received sustainable development training, for total training of 4,000 employees to date.

## OPG'S INFLUENCE SPREADS

SustainableElectricity
It's in our power™

Canadian Electricity Association's ***Sustainable Electricity*** Program. By committing to the program, CEA utility members will integrate the program's guiding environmental, social and economic principles into their daily business activities and aim to improve their overall sustainable development performance. The program became official February, 2009, when Karl Smith (Chair, CEA Board of Directors, and President/CEO, Fortis Alberta) signed on behalf of the CEA Board. Witness to the event were (L to R) Pierre Guimond (President, CEA), Pat Youzwa (Chair, CEA Sustainable Electricity Executive Council, and President/CEO, SaskPower), and The Honourable Mike Harcourt (Chair, *Sustainable Electricity* Program Public Advisory Council, and former Premier of British Columbia).

# Environmental Performance

Commitment to sustainable development is reflected in OPG's efforts to minimize the environmental footprint of its operations, while meeting the company's obligation to produce power for the residents of Ontario.

## KEY ENVIRONMENTAL PERFORMANCE BENCHMARKS

Compliance with hundreds of environmental laws, regulations, by-laws and requirements contained in operating permits and Certificates of Approval is mandatory for OPG. We consider regulatory compliance to be a minimum, non-negotiable

Courtice high school students help plant the Darlington butterfly garden

**Table 1: Corporate Environmental Performance Benchmarks (2008)** (All benchmarks are voluntary except where otherwise specified)

| Category | 2008 Benchmark | 2008 Year-End | Benchmark Met |
|---|---|---|---|
| Spills [1] | Major A = 0<br>Moderate B = 0<br>Minor C ≤ 52 | | Yes<br>Yes<br>Yes |
| Regulatory Compliance | Infractions [2] ≤ 84 | | Yes |
| Energy Efficiency | 13 GWh saved (Hydro) | | Yes |
| Air Emissions | $NO_x$ (as $NO_2$) ≤ 27.9 Gg net<br>$SO_2$ ≤ 124.7 Gg net<br>Total Acid Gas ≤ 236 Gg gross<br>$NO_x$ (as $NO_2$) rate (Gg/TWh-delivered) [4]<br>$CO_2$ (gross Tg) | | Yes [3]<br>Yes<br>Yes<br>Mixed [5]<br>NA |
| Critical Group Dose | Pickering ≤ 10 µSv<br>Darlington ≤ 7.5 µSv | | Yes<br>Yes |
| Low & Intermediate Level Radioactive Waste | ≤ 3,486 $m^3$ | | Yes |
| Ash & Gypsum Diverted from Landfill | Gg | | NA |

# Environmental Performance

Commitment to sustainable development is reflected in OPG's efforts to minimize the environmental footprint of its operations, while meeting the company's obligation to produce power for the residents of Ontario.

## KEY ENVIRONMENTAL PERFORMANCE BENCHMARKS

Compliance with hundreds of environmental laws, regulations, by-laws and requirements contained in operating permits and Certificates of Approval is mandatory for OPG. We consider regulatory compliance to be a minimum, non-negotiable

▲ Courtice high school students help plant the Darlington butterfly garden.

**Table 1: Corporate Environmental Performance Benchmarks (2008)** (All benchmarks are voluntary except where otherwise specified)

| Category | 2008 Benchmark | 2008 Year-End | Benchmark Met |
|---|---|---|---|
| Spills [1] | Major A = 0 | 0 | Yes |
| | Moderate B = 0 | 0 | Yes |
| | Minor C ≤ 52 | 10 | Yes |
| Regulatory Compliance | Infractions [2] ≤ 84 | 16 | Yes |
| Energy Efficiency | 13 GWh saved (Hydro) | 13.8 | Yes |
| Air Emissions | $NO_x$ (as $NO_2$) ≤ 27.9 Gg net | 29.5 gross [3] | Yes [3] |
| | $SO_2$ ≤ 124.7 Gg net | 75.4 gross [3] | Yes |
| | Total Acid Gas ≤ 236 Gg gross | 104.9 [3] | Yes |
| | $NO_x$ (as $NO_2$) rate (Gg/TWh-delivered)[4] | 1.26 | Mixed [3] |
| | $CO_2$ (gross Tg) | 23.3 gross | NA |
| Critical Group Dose | Pickering ≤ 10 µSv | 4.1 | Yes |
| | Darlington ≤ 7.5 µSv | 1.3 | Yes |
| Low & Intermediate Level Radioactive Waste | ≤ 3,486 $m^3$ | 2,708 | Yes |
| Ash & Gypsum Diverted from Landfill | Gg | 616 | NA |

▲ Ottawa St. Lawrence Plant Group employees transferring eels for release to the St. Lawrence River

(1) OPG ranks the severity of spills according to guidelines set by the company's Spills Severity Rating Procedure, which mirrors Ontario Ministry of the Environment guidelines.

(2) Infractions - Include any incident resulting in regulatory action, including the issuance of a Notice of Violation, an order, a prosecution or other compliance action. All violations that lead to an Environmental Penalty are considered infractions.

(3) Banked emission allowances were used to meet net emission targets for $NO_x$. In 2008, O.Reg. 397/01 allocated 27.9 Gg of $NO_x$ (as $NO_2$) and 124.7 Gg of $SO_2$ allowances to OPG. The Regulation provides for the use of banked or purchased allowances or limited amounts of emission reduction credits to offset emissions in excess of the allowance allocations. Notwithstanding the preceding, O.Reg. 153/99 limits OPG's total gross $SO_2$ emissions to 175 Gg and total gross acid gas emissions to 236 Gg. $NO_x$ is expressed as mass $NO_2$.

(4) $NO_x$ emission rate targets are based on "delivered energy". Delivered energy is defined as "gross energy output from a generating unit, less unit service (energy supplied by and consumed by the unit), while connected to the electricity grid". The $NO_x$ emission rate (Gg/TWh-delivered) is the total of all fossil station $NO_x$ emissions divided by the total delivered energy from all fossil units.

(5) $NO_x$ rate targets vary by generating unit. Two $NO_x$ target rates were not met due to extended minimum and low load operation.

standard for progress towards sustainable development and we have established voluntary internal environmental targets to help ensure that our overall performance continues to improve beyond compliance.

Accordingly, each year OPG sets key benchmarks, or targets, for improving environmental performance. Progress towards meeting benchmarks is tracked and managed through OPG's Environmental Management System. These efforts are reinforced by an Annual Incentive Plan that links management's compensation to meeting or surpassing established environmental targets.

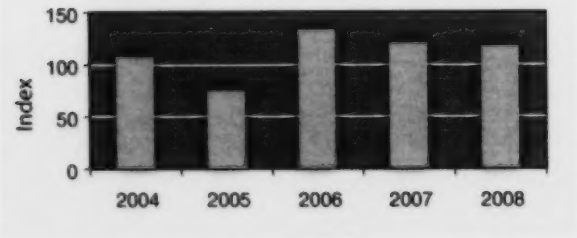
As is evident based on a review of Table 1, OPG's success in meeting 2008 environmental benchmarks was favourable.

OPG's environmental practices are assessed annually using an Environmental Performance Index (EPI). The EPI was first introduced in 2001, and it is based upon weighted scores calculated relative to voluntary performance targets for spills, regulatory compliance, energy efficiency, radiation emissions and waste management. The scoring system ranges from zero to 150, with higher scores reflecting better performance. An overall score of 100 indicates that, on average, targets were met, scores greater than 100 indicate performance better than target, and scores less than 100 indicate performance that did not meet targets.

In 2008, OPG's EPI was 117, which reflects a decrease relative to the 2007 EPI of 120 (see Figure 1). The reduction in the EPI for 2008 vs. 2007 was largely attributable to the following:

- **Fossil $NO_x$ Emission Rates** – Lambton Units 3 & 4 did not operate within their $NO_x$ vs. load performance target because equipment problems restricted maximum unit load below minimum load requirement for SCR operation. Nanticoke Units 7 & 8 marginally exceeded their $NO_x$ target due to SCR equipment availability issues and extended low load operation requiring SCRs to be turned off.
- **Tritium Emissions** – exceeded target due to a number of factors, including poor performance of the Pickering A dryers. Additional issues being addressed include the development of a spare parts list, keeping critical components on site, and better management of heavy water leaks and dryer outages.

**Figure 1: Environmental Performance Index, 2004 – 2008**



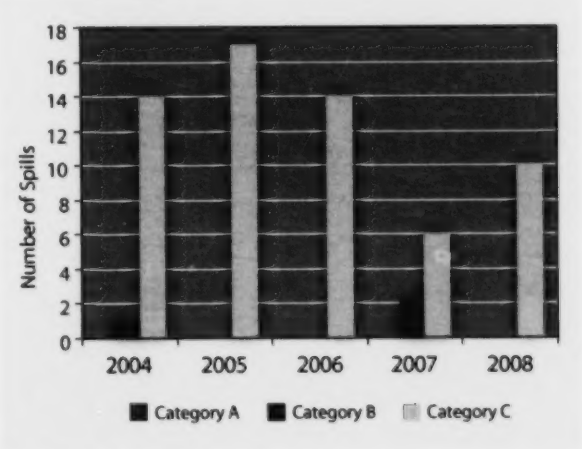

**ISO 14001: 2004**: OPG's ISO 14001 Environmental Management System (EMS) helps to ensure that the company complies with its environmental policy within a framework of continual improvement. OPG first received certification for its Corporate level EMS and all of its generating facilities in 1999, with the exception of Central Hydro Plant Group, which was certified in 2000. In 2008, the Corporate level EMS and the EMSs for all of the generating facilities withstood an external registration audit process to retain certifications based on an upgraded ISO 14001:2004 standard.

## Spills

The classification of spills is based on their potential impact on the environment: Category A spills have a major impact, Category B spills have a moderate impact, and Category C spills have a minor impact. These categories mirror the Ontario Ministry of the Environment (MOE) guidelines.

In 2008, OPG experienced zero category A spills, zero B spills and 10 C spills. Of the C spills, seven and three were attributable to hydroelectric and fossil generation respectively.

**Figure 2: Spills Performance, 2004 – 2008[1]**




[1] Category A, B and C spills have major, moderate and minor environmental impacts, respectively.

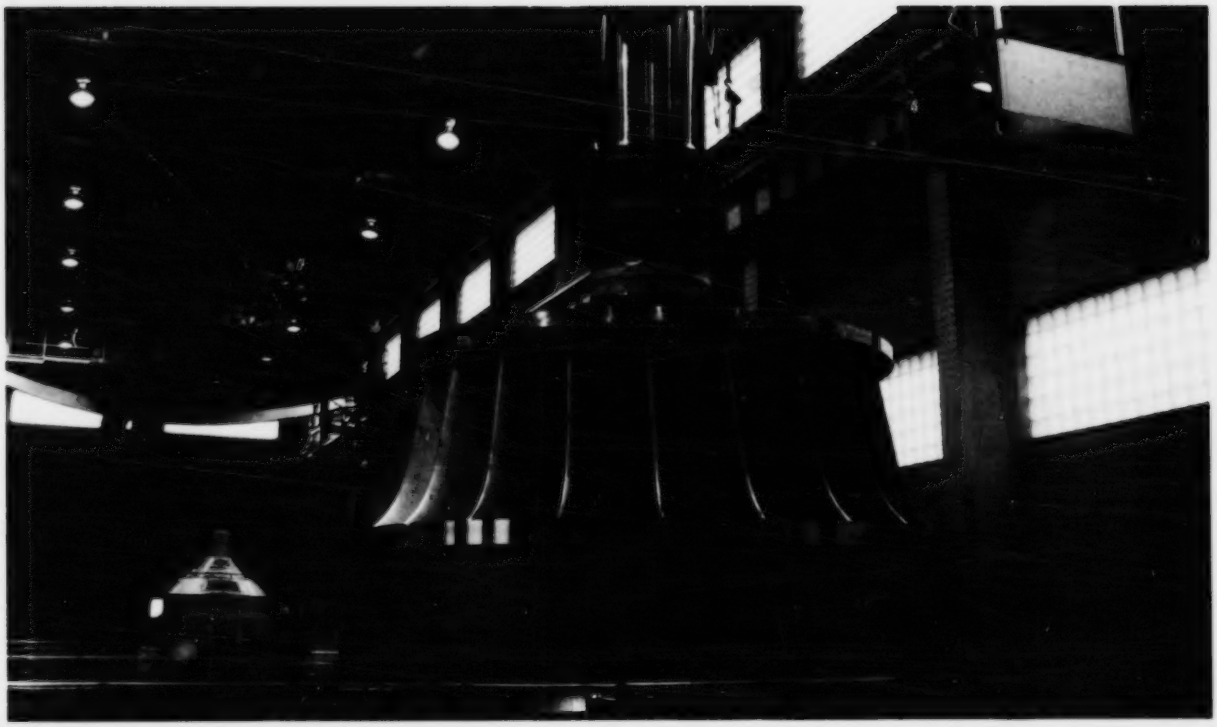
## Regulatory Compliance

OPG must comply with a multitude of requirements contained in statutes, regulations, bylaws, operating permits and Certificates of Approval.

In 2008, OPG experienced 16 environmental infractions. Of those infractions, nine, five and two were attributable to fossil, nuclear and nuclear waste management operations respectively.

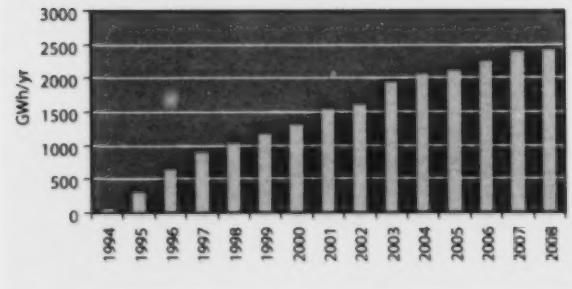
## Energy Efficiency

Beginning in 1994, OPG's predecessor company, Ontario Hydro, committed to an energy efficiency program, and 14 years later the program remains highly successful. Indeed, from 1994 – 2008, OPG's annualized energy savings have increased by 2,405 GWh (see Figure 3), resulting in annual savings of $114 million (at a market average of 4.6 cents/kWh) and emission savings of approximately 2.41 million tonnes of $CO^2$.



▲ The runner upgrade at Des Joachims GS achieved 11 GWh of energy efficiency savings.

**Figure 3: Cumulative Energy Efficiency Savings 1994 - 2008**




In 2008, OPG achieved an internal energy efficiency saving of 15.7 GWh/yr. This saving was primarily attributable to efficiencies in hydroelectric and real estate operations.

Within the hydroelectric division, The Ottawa-St. Lawrence Plant Group achieved 13 GWh/yr savings through turbine runner upgrades at Chats Falls GS and Des Joachims GS. In the Northeast Plant Group, 0.83 GWh/yr were realized through transformer upgrades at the Abitibi Canyon GS.

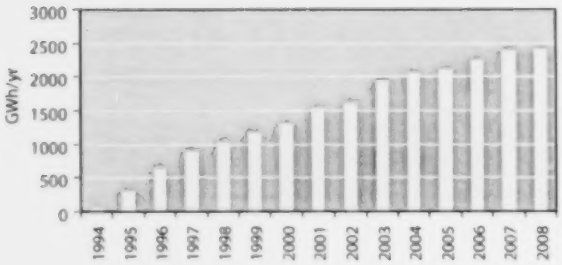
Within real estate services at OPG Head Office, the installation of variable frequency drives on ventilation fans resulted in savings of 1.79 GWh/yr. A lighting retrofit, to LED lighting, in the building elevators produced an additional 0.04 GWh/yr savings.

## Environmental Performance

| | |
|---|---|
| **ENERGY EFFICIENCY** Hydroelectric energy efficiency savings alone were 13.8 GWh/yr, enough to power about 1,400 households for one year. | 15.7 GWh/yr saved |
| **CLEAN PRODUCTION** Hydroelectric and Nuclear accounted for 78 per cent of production, virtually free of air emissions causing smog, acid rain and global warming. | 78% |
| **EMISSIONS** A total acid gas emissions rate of 4.53 grams/kWh was OPG's lowest ever, 25 per cent lower than 10 years ago at OPG's inception. | 25% |

▲ The runner upgrade at Des Joachims GS achieved 11 GWh of energy efficiency savings.

Figure 3: Cumulative Energy Efficiency Savings 1994 - 2008




In 2008, OPG achieved an internal energy efficiency saving of 15.7 GWh/yr. This saving was primarily attributable to efficiencies in hydroelectric and real estate operations.

Within the hydroelectric division, The Ottawa-St. Lawrence Plant Group achieved 13 GWh/yr savings through turbine runner upgrades at Chats Falls GS and Des Joachims GS. In the Northeast Plant Group, 0.83 GWh/yr were realized through transformer upgrades at the Abitibi Canyon GS.

Within real estate services at OPG Head Office, the installation of variable frequency drives on ventilation fans resulted in savings of 1.79 GWh/yr. A lighting retrofit, to LED lighting, in the building elevators produced an additional 0.04 GWh/yr savings.

## Environmental Performance

**ENERGY EFFICIENCY**
Hydroelectric energy efficiency savings alone were 13.8 GWh/yr, enough to power about 1,400 households for one year.

**15.7**
GWh/yr saved

**CLEAN PRODUCTION**
Hydroelectric and Nuclear accounted for 78 per cent of production, virtually free of air emissions causing smog, acid rain and global warming.

**78%**

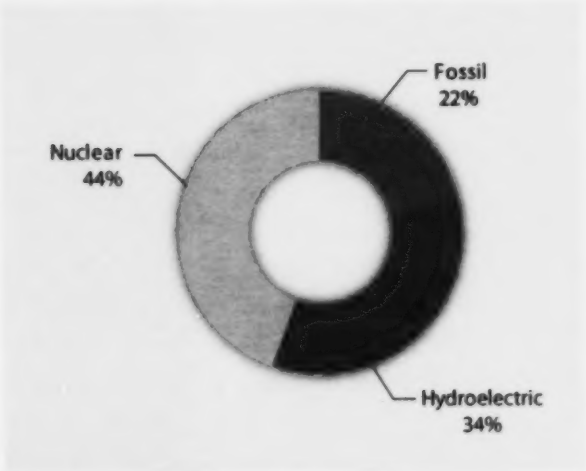
# Air

## Generation Mix

In 2008, approximately 78 per cent of OPG's electricity production was derived from hydroelectric and nuclear sources that were virtually free of air emissions causing smog, acid rain and global warming (see Figure 4).

The remaining production came from five fossil-fuelled stations. Four of these stations use coal as their primary source of energy and one is dual-fuelled by oil and natural gas. An advantage of fossil stations, relative to nuclear and hydroelectric facilities, is their capacity to respond to short term peaks in demand for power.

**Figure 4: OPG's 2008 Generation Mix**




OPG's fossil-fuelled plants supply electricity demand that is not first met by other Ontario supply sources such as nuclear, hydro and Ontario's growing portfolio of alternative generation. They provide the flexibility to meet changes in demand that occur by the minute, day and year. This flexibility means that electricity production from these plants and air emissions will vary from minute to minute and day to day throughout the year.

Due to a decline in Ontario electricity demand in 2008 and increased production from nuclear and hydro facilities, OPG's fossil-fuelled plants produced 20 per cent less electricity in 2008 than they did in 2007. As a result total emissions of $CO_2$, $SO_2$ and $NO_x$ declined.

**Looking Ahead**: OPG is transitioning to a lower carbon future. Consistent with direction from the Government of Ontario, there will be targeted year over year reductions in $CO_2$ emissions in 2009 and 2010 and an absolute $CO_2$ emissions cap starting in 2011. This will result in significant decreases in other emissions of concern through this time period. OPG will continue to operate our coal plants as safe, reliable and environmentally responsible producers of electricity for as long as these facilities are required.

## Nitrogen Oxides ($NO_x$) And Sulphur Dioxide ($SO_2$) Emissions

The generation of electricity through the combustion of coal results in air emissions that include nitrogen oxides ($NO_x$), sulphur dioxide ($SO_2$) and carbon dioxide ($CO_2$). Various other contaminants, released in lesser amounts as a result of combustion, are documented in Appendix B.

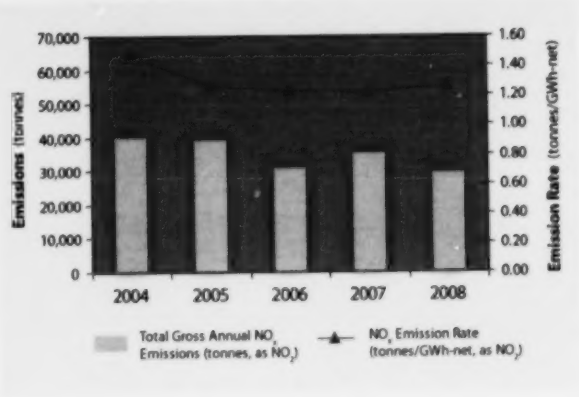
$NO_x$ and $SO_2$ emissions lead to the formation of acid gas precipitation, ground-level ozone and smog. Accordingly, recognizing that $NO_x$ and $SO_2$ can have negative environmental impacts, these emissions have long been the focus of OPG's air emission reduction efforts.

A key measure of environmental performance is the acid gas emission rate ($NO_x$ plus $SO_2$ per kilowatt hour of electricity produced). The 2008 total acid gas emission rate of 4.53 grams/KWh was OPG's lowest ever and was 25 per cent lower than it was since OPG's inception ten years ago. Lambton GS Units 3 & 4, equipped with flue gas desulphurization (FGD) equipment and Selective Catalytic Reduction (SCR) for $NO_x$ reduction are recognized as two of the cleanest coal-fired generating units in North America. Two units at Nanticoke GS are also equipped with SCR technology.

Low emission rates and lower generation helped the fossil plants achieve the lowest total acid total gas emissions in the past 25 years.

Based upon a Memorandum of Agreement, between the Province of Ontario and OPG, OPG has been given direction that it "*will not pursue investment in non-hydro-electric renewable generation projects unless specifically directed to do so by the shareholder.*" Thus, OPG is not at liberty to bring into its generation mix non-hydro-electric "green energy" supply, unless the shareholder so directs.

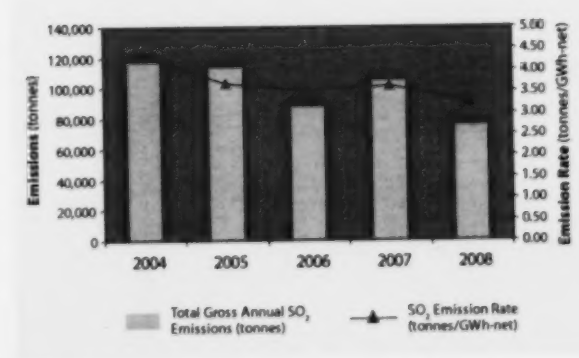
Figure 5: $NO_x$ Emissions and $NO_x$ Emission Rates for OPG Fossil Generation (2004-2008)




The $NO_x$ emission rates were reduced in the 1980s and 1990s through a series of combustion improvements. The general trend to a reduction in $NO_x$ emission rates since 2004 is largely the result of the addition of SCRs on four coal units.

The fossil plants achieved one of the lowest $NO_x$ emission rates per unit of electricity produced in OPG's history, slightly higher than that achieved in 2007. This slightly higher rate was due to higher frequency of operation at low production levels which compromised the performance of SCR equipment at Lambton GS and Nanticoke GS.

Figure 6: $SO_x$ Emissions and $SO_x$ Emission Rates for OPG Fossil Generation (2004-2008)




Major reductions in $SO_2$ emissions and emission rate were achieved through the 1980s by using more and lower sulphur coal in the fossil fuel mix. Further reductions were achieved in the early 1990s by outfitting Lambton GS with two flue gas desulphurization units, and later with increased use of low sulphur coal at Nanticoke GS. Lower levels of generation and a lower emission rate combined for lower total emissions in 2008. The $SO_2$ emission rate in 2008 was the best in OPG's history.

## Greenhouse Gas (GHG) Emissions

OPG's primary greenhouse gas (GHG) emission is $CO_2$, released through the operation of fossil fuelled generating stations. In 2008, OPG generated approximately 78 per cent of its energy from nuclear and hydroelectric sources, which avoided the equivalent emission of 85 million tonnes of $CO_2$ that would have been released had that electricity been generated from fossil fuelled stations.

In 2008, OPG's total gross $CO_2$ emissions were 23.3 million tonnes (see Figure 7). The $CO_2$ emission rate from the fossil fuelled fleet was 1004 tonnes/GWh-net.

The $CO_2$ emission rate varies slightly from year to year and is influenced by the distribution of generation across the fossil-fleet. The 2008 emission rate was slightly higher than it was in 2007. However, as a result of lower production from our fossil plants in 2008, OPG's total $CO_2$ emissions declined. Notably, $CO_2$ emissions were lower than they were in 1990 - the base year for the Kyoto Protocol.

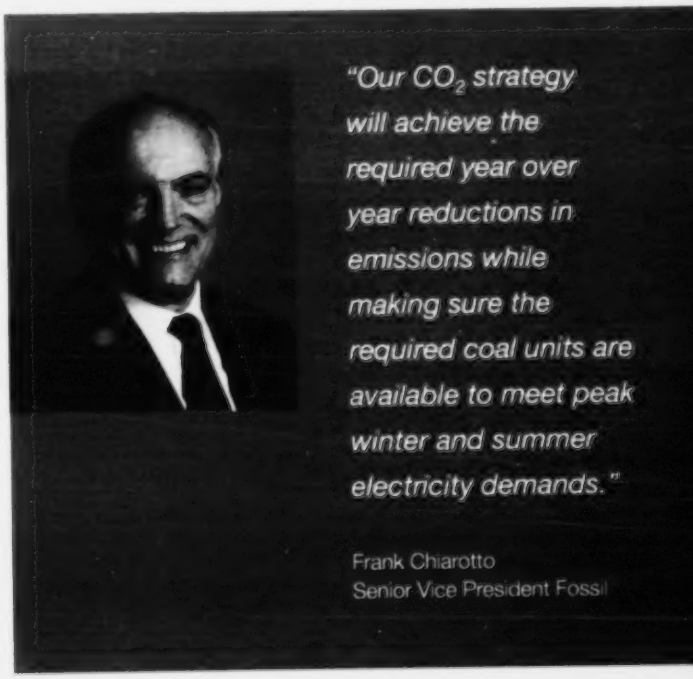
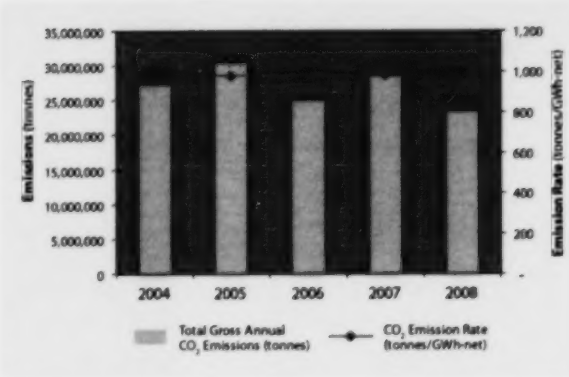

"Our CO2 strategy will achieve the required year over year reductions in emissions while making sure the required coal units are available to meet peak winter and summer electricity demands."
Frank Chiarotto
Senior Vice President Fossil

Figure 7: $CO_2$ Emissions and Emission Rates for OPG Fossil Generation (2004-2008)




Starting in 2009, OPG will reduce $CO_2$ emissions from coal plants in a manner consistent with government direction. By 2011, emissions will be limited to 11 million tonnes of $CO_2$ compared to a total of 23 million tonnes in 2008.

## Radiation

The operation and maintenance of OPG's nuclear reactors releases low levels of radioactivity. The design of the nuclear plants minimizes these releases through, for example, multiple passive barriers including a one kilometre exclusion zone separating the public from the reactor building. Air dryers are used to remove tritium from the air, and filters capture particulate matter and iodine. Operating procedures also protect the health of employees and the public.

## Biomass: Looking to the future

OPG continues to assess the technical feasibility and economics associated with the use of biomass as a substitute for coal in some of its coal-fuelled generating units. While electricity production from these plants would be much lower, biomass from forest and agricultural based sources is recognized around the world as a renewable source of energy. It is considered "carbon neutral" as burning and subsequent plant growth does not add to greenhouse gases in the atmosphere. OPG's biomass program does not use food crops and requires fuels to be from sustainable sources.

Studies are underway to identify required combustion modifications, storage and handling facility modifications and the development of safe storage and handling practices. OPG is working with the agriculture and forestry industries to develop biomass supply channels. In 2008 biomass test burns at OPG's Atikokan, Nanticoke and Lambton plants produced more than seven million kilowatt hours of electricity, enough to power more than 500 homes for a year and displace close to 7,000 tonnes of carbon dioxide emissions.

If successful, OPG's biomass program will provide more renewable energy for Ontario, make use of existing generating stations owned by the people of Ontario and promote development of a made in Ontario energy industry.

▼ Biomass Silos at Nanticoke GS

"Critical Group Dose" is a method used to measure radiation exposure to members of the public who live in close proximity to nuclear plants. Critical Group Dose calculations focus on the public's actual eating and drinking habits as obtained from survey data. The survey includes six age groups: three month old nursing infant, one year old infant, children aged five, 10 and 15 years and adult. Critical Group Dose is measured in microsieverts (μSv), an international unit.

In 2008, Critical Group Dose levels for Pickering GS and Darlington GS were 4.1 and 1.3 μSv, respectively, substantially below the limit of 1,000 μSv set by the Federal government. By comparison, the average Canadian receives about 2,000 μSv per year from natural sources such as cosmic rays and radon in the soil.

# Land

## Low and Intermediate Level Radioactive Waste (LILRW)

Nuclear operations produce Low and Intermediate Level Radioactive Waste (LILRW), which may include gloves, coveralls, booties, wipes and tools that have been radioactively contaminated. In 2008, LILRW production (2,708 $m^3$) was better than the annual performance benchmark (3,486 $m^3$).

The 2008 LILRW performance was a significant improvement over 2007, when year-end waste production was 3,043 $m^3$. This result reflects positive actions taken to address external and internal assessments – by the World Association of Nuclear Operators - WANO, Electric Power Research Institute - EPRI, and the Operational Safety and Review Team - OSART – which focused on OPG's LILRW Program. These assessments indicated there was "room for improvement" in nearly all program elements. Accordingly, in 2008, Darlington GS continued to focus on a de-packaging program that began in 2007, while Pickering GS continued to implement a new re-washables program also initiated in 2007. Notably, 2008 year end performance was 22.3 per cent better than the annual target, which was generally attributable to the continued introduction of launderable products at operating facilities.

## Ash and Gypsum Diversion

By-products of fossil fuel combustion include coal fly ash, coal bottom ash and gypsum. However, rather than treating these by-products as "waste", OPG sees them as commercial products for which the company has developed markets. To illustrate, fly ash is used in the manufacture of cement and concrete, in controlled low strength material, as hydraulic mine backfill and as a liquid waste stabilizer. Bottom ash is used as granular fill in road beds and gypsum is used for the manufacture of wallboard.

In 2008, OPG utilized 63 per cent of its total ash and gypsum production, or 615,918 tonnes out of a total production of 975,213 tonnes. This result reflects a relatively steady rate of utilization of these by-products over the past four years, though less than the highest rate of 74 per cent achieved in 2004. Solid combustion by-products that are not used are sent to a recoverable landfill where they may be subsequently used in the event that commercial markets develop.

## PCB Management

New federal PCB regulations were enacted in September 2008. These regulations now mandate phase out dates and reporting for various classes of PCB equipment. OPG's Policy on PCB Management, implemented in 1998, voluntarily committed the company to the phase-out and destruction of 81 per cent (relative to 1994 inventories) of in-storage PCB waste and high-level in-service PCBs by 2005, and the remainder by 2015. Successful implementation of this pro-active policy has put OPG in a strong position with respect to compliance with the new regulations.

OPG is on track to eliminate all of its in-service high-level PCBs by the end of 2009. Building upon the initiative of its predecessor company, Ontario Hydro, OPG has reduced its inventory of in-service PCBs and PCB waste by approximately 98 per cent since 1994. In 2008, OPG shipped approximately 20 tonnes of high- and low-level PCB waste for destruction. As of December 2008, OPG's inventory of PCB waste and in-service PCB equipment (excluding very low level PCB) was 70 tonnes, as compared to 3,427 tonnes in 1994.

The new regulations created an additional class of PCB equipment, with very low levels of PCB (2-50 ppm) not previously regulated nor included in OPG's inventory. This change has increased OPG's total PCB equipment inventory to approximately 7,800 tonnes (comprising approximately two million litres of oil and approximately six thousand tonnes of equipment carcass).

## Mercury Monitoring and Reporting

In 2008, OPG implemented a Mercury Monitoring and Reporting Program established in accordance with the requirements developed under the Mercury Canada-wide Standard process and approved by the Ontario Ministry of the Environment. The program requires the routine sampling and analyses of coal and coal combustion by products and stack sampling for mercury. Annual reports are submitted to MOE in accordance with the approved program.

In 2008, OPG's coal-fired facilities emitted 191 kg of mercury, the lowest level on record.

Further information on the Mercury Canada-Wide Standard can be found at the CCME website: ccme.ca.

## Land Assessment and Remediation

In 1997, in response to a Director's Order from the Ontario Ministry of the Environment, OPG introduced a program to assess and remediate historical contamination on properties occupied by its generating facilities. The contaminants of concern were fuel oil, transformer oil, waste lubricants and tritium. Sites were assessed and ranked as high, medium and low in reference to the need for remediation. OPG's first Site Assessment Plan, filed with the Ministry in 1998 and each year thereafter, identified 50 high priority sites with known or potential contamination. OPG has completed all of the assessments required by the Director's Order, and the Order was closed out by the Ministry of the Environment, March 2004. Assessment of medium and low priority sites continues under OPG's voluntary site assessment program.

At the end of 2008, remediation of 34 sites had been completed. Remediation was ongoing at 10 sites and planned for three additional sites starting in 2009. By the end of 2010, remediation of all medium and low priority sites will be complete.

## Other Contaminants

OPG's National Pollutant Release Inventory (NPRI) data, which document emissions to air, water and land for 2007, are presented in Appendix B. Based on this data, compiled by Environment Canada, no OPG plant is ranked among the 100 facilities in Ontario which release the largest amounts of known carcinogens to air or water.

For detailed information on the breakdown of OPG's NPRI data by emissions to air, water and land please visit the NPRI web site at: **http://www.ec.gc.ca/pdb/npri/npri_home_e.cfm** .

## Biodiversity and Habitat Stewardship

The conservation of biological diversity is an integral part of OPG's sustainable development efforts. Biodiversity, as a term, refers to the variety of life on earth. It includes the diversity of ecosystems, the diversity of species within those ecosystems and the genetic diversity within species. It also includes the ecological and evolutionary processes that keep them functioning and evolving. From an OPG perspective, it refers to the variety of life in the regions where we operate or may affect.

Every business and industry, by their very actions as consumers of resources and emitters of wastes, draws down natural capital, and consequently, has effects on biodiversity either directly through habitat loss and fragmentation or indirectly through various pollution pathways to land, water and air. That reality also applies to OPG. The challenge is to reduce the adverse effects of our operations, while enhancing the resiliency of the ecosystems within which we operate.

OPG has a proud history as a company working to protect nature. The goal of OPG's Biodiversity Policy, which has existed since the inception of the company, is to demonstrate that we can co-exist with nature without causing or contributing to the long-term decline of species, or the habitats upon which they depend, on a regional basis. Our policy and our conservation actions demonstrate that industry can and does have a clear role to play in conserving Ontario's biodiversity. It builds on the notion that we should retain what is ecologically significant; restore habitats which have been degraded; replace habitats which have been destroyed where ecologically and economically feasible; and recover the habitats and populations of species at risk. Our actions support Ontario's Biodiversity Strategy. That strategy recognizes that all levels of government, non-governmental organizations, industry and the public must cooperate in the care of Ontario's rich biological assets.

Sustaining biodiversity really is a long term business imperative. More fundamentally, we could not survive without the services that biodiversity provides. That essential imperative is captured in the title of Ontario's Biodiversity Strategy - "Protecting what Sustains Us" and in various government regulations and policies to conserve biodiversity and protect species at risk. OPG's habitat stewardship efforts not only help to conserve biodiversity, but they also help to protect what sustains us.

The effort to conserve biodiversity not only addresses issues of land and water management, but it also includes extensive work to reduce waste streams and to prevent and reduce pollution. We are addressing the root causes for the imperilment of biodiversity within the context of our own operations.

Impacts on biodiversity are recognized as a significant environmental aspect that are managed and integrated into all of our environmental management systems, which are also registered through ISO 14001. Baseline inventories have been conducted at each of our plants and major land holdings to identify what is ecologically significant and/or sensitive, as the basis for implementing our 4 R's for conserving biodiversity. Accordingly, each of our nuclear and fossil plants and hydroelectric plant groups have developed their own biodiversity plans to help protect and enhance significant habitats and the species they support. To ensure those plans are robust, they have been both certified and audited by the U.S. based Wildlife Habitat Council, which has proven to be a very effective partnership.

▼ Tree Planting event at Pickering's Alex Robertson Park

## Wildlife Habitat Council Recognizes OPG's Commitment to Biodiversity

One of OPG's more notable biodiversity partnerships is with the U.S. Wildlife Habitat Council (WHC). The WHC is a not-for-profit, non-lobbying group of corporations, conservation organizations and individuals dedicated to assisting corporate landowners in the development of programs that protect, conserve and enhance wildlife habitat and biodiversity and foster environmental values. They act as an independent advisor and certifier of programs and work to build the company's image while contributing to wildlife habitat rehabilitation. OPG and its predecessor company Ontario Hydro, has been a member of the WHC since 1996. It has proven to be a very good fit with OPG's site biodiversity management programs.

The WHC certification process, which is on a two-year cycle, helps to keep our site biodiversity programs dynamic and functional within the context of continual improvement. Certification brings pride with staff at the plant, and builds credibility with local communities. Sites that have been certified under WHC's "Corporate Lands for Learning" are specifically designed for community outreach and experiential learning about biodiversity. It's a win for nature, a win for public education and win for community outreach and good relations.

OPG currently has 11 sites certified by the WHC for exemplary wildlife habitat enhancement programs. Those sites include: Niagara Plant Group; Northeast Plant Group - Mattagami River; Ottawa-St. Lawrence Plant Group - Madawaska River; Western Waste Management Site (Nuclear Waste Management Division); Pickering Nuclear; Darlington Nuclear; Atikokan GS; Lennox GS; Nanticoke GS; Lambton GS and Thunder Bay GS. Two of these sites, Darlington GS and Pickering GS, have also achieved WHC certification for Corporate Lands for Learning.

OPG has an excellent record of achievement and recognition through the WHC. That record saw a significant boost in 2008, when OPG was yet again the distinguished recipient of two coveted awards at the WHC's annual symposium in Baltimore, Maryland. Notable recognition includes:

## Brook Trout Habitat

OPG's Wesleyville Site is located along the shoreline of Lake Ontario west of Port Hope, Ontario. Apart from the main industrial facilities, the site features expansive tracts of natural and agricultural lands that include woodlands, wetlands, pasturelands, and a highly valued cold-water stream, Wesleyville Creek.

Wesleyville Creek is recognized as one of the highest quality cold-water streams remaining in the region. OPG's focus has been to assist brook trout populations by clearing stream barriers, flushing sediments, and reducing competition from non-native fish. Removal of such barriers is directed by a fisheries biologist from the Ganaraska Region Conservation Authority (GRCA). In 2008, no barrier removal was required.

To assess the success of our efforts, the GRCA biologist monitors the brook trout population by electro-fishing and by spawning or "redd" surveys. The last comprehensive assessment was completed in 2005 and indicated a significant improvement in overall size and age structure (more young) in the population. A survey was not conducted in 2008 but is planned for 2009.

- **International Conservation Award - Corporate Habitat of the Year Award (Darlington GS):**

  This award recognizes outstanding environmental stewardship and voluntary employee efforts on sites that are currently certified with WHC. Darlington GS came away with the coveted Corporate Habitat of the Year. This international award is recognized as the ultimate corporate environmental award offered by the WHC and the competition is intense among many proud companies. OPG is distinguished as being a three-time winner of this award (2008 – Darlington GS; 2007 – Pickering GS; 2001 – Pickering GS).

- **Wings Over Wetlands Award:**

  This North American-wide award is jointly offered by the WHC and Ducks Unlimited Inc. The award was created in 2007 to encourage active corporate participation in wetland stewardship, and to recognize those who have created and protected wetland habitat for the benefit of waterfowl, other wildlife, floral species and people. It was presented to OPG at the WHC's 20th Annual Symposium in Maryland, 2008. The Award was granted in recognition of OPG's long standing relationship with Ducks Unlimited Canada to protect and restore important wetland habitat across Ontario.

These Awards can be added to a growing list of international awards and nominations for awards that OPG has received from the WHC, including:

- 2007 – Pickering GS wins Corporate Habitat of the Year Award
- 2007 – Pickering GS wins 20th Anniversary Signatures of Sustainability Award
- 2007 – Darlington GS wins 20th Anniversary Signatures of Sustainability Award
- 2007 – Niagara Plant Group nominated for Corporate Habitat of the Year Award
- 2005 – Darlington GS nominated for Corporate Habitat of the Year Award
- 2005 – Lennox GS nominated for Rookie of the Year Award
- 2004 – Pickering GS nominated for Corporate Habitat of the Year Award
- 2001 – Pickering GS wins Corporate Habitat of the Year Award
- 1997 – Darlington GS wins Rookie of the Year Award

## OPG's Carbon Sequestration and Biodiversity Management Program

We recognize that our effects on nature do not stop at the boundaries of our plants, nor do our efforts to protect and restore nature. Accordingly, we have invested in significant habitat protection and restoration efforts in the communities where we operate and in strategic locations across southern Ontario, including some of the most biologically imperiled regions in Canada.

OPG's carbon sequestration and biodiversity management program is an example of that effort. This unique tree planting program creatively attempts to address two global issues that also have great relevance to Ontario, namely global biodiversity losses and global climate change. More specifically, this program is linking the need to restore habitat for forest wildlife that are at risk in the highly fragmented landscapes of southern Ontario with the need to sequester carbon, as a mitigation offset to greenhouse gas emissions from our fossil plants. It is a significant biodiversity management program and it is also a significant adaptation management program to hedge against the adverse effects of climate change on southern Ontario's biodiversity.

The planting program purposely focuses on restoring forest habitat in the human dominated landscapes of southern Ontario (defined as the region south of the Canadian Shield). Habitat losses are most acute in the Carolinian biotic zone of southwestern Ontario, which is considered one of the most ecologically imperiled regions in Canada. There are more species at risk in this region than anywhere else in Canada. Protecting and restoring habitat is vital to the recovery of many of these species. It also represents important "insurance" to help prevent even more species from becoming at risk or regionally extirpated.

Since its introduction in the spring of 2000, OPG through its many conservation partners, have planted more than 3.2 million native trees and shrubs matched to site conditions, on more than 1,525 hectares of land (see Figure 8). These plantings have occurred in strategic locations to help "reconnect the fragmented landscape" that characterizes much of southern Ontario. It will also help enhance the resiliency of woodland ecosystems to withstand the effects of climate change, while also naturally sequestering $CO_2$ over the lifetime of those trees, helping to mitigate global warming.

Our plantings are targeted to expand key core forested areas and connect woodland patches to help promote the recovery of wildlife that are at risk in the heavily fragmented landscapes of southern Ontario. Sites are identified using regional scale natural heritage systems such as the Carolinian Canada's Coalition's "Big Picture", or a more local refinement thereof. The use of such systems helps us to achieve the greatest ecological and social value for our investment dollar.

Management plans have been developed for each site with explicit objectives linked to regional biodiversity conservation priorities. Sites are routinely monitored, survivorship assessments completed, and where necessary replacement plantings are undertaken to ensure long-term project success.

Developing a system of habitat cores and corridors to increase habitat connectivity will help to conserve biodiversity across southern Ontario. That same greenway system of natural areas will also provide enhanced recreational opportunities for the communities living within the region, while also providing renewable resources and other important ecosystem services by reducing erosion, enhancing soil structure, recycling nutrients and enhancing both air and water quality. In short, OPG is part of an expanding effort to help protect and restore the forested ecosystems which once characterized much of the southern Ontario landscape.

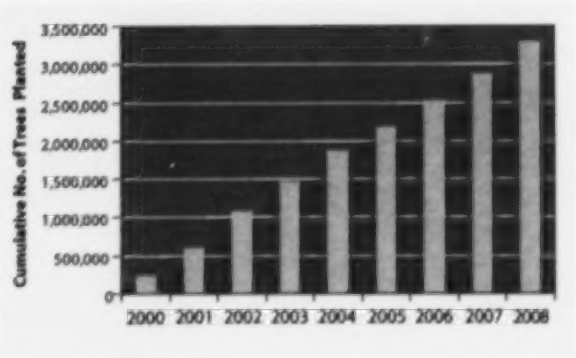
This award winning program was recognized again in 2008. OPG, together with its partners, the Long Point World Biosphere Reserve and the Long Point Region Conservation Authority, were recognized by the Carolinian Canada Coalition

### OPG's Fish Working Group

**In 2008, OPG formed a Fish Working Group (FWG) to advise and support the senior management of OPG on substantive legal, societal and scientific matters regarding OPG's operations and impacts on fish populations, communities and habitat. Specifically, the FWG will make recommendations to management and other stakeholders regarding new and potentially forthcoming regulations pertaining to fish and fish habitat (with a special focus on the federal *Fisheries Act* and the Ontario *Endangered Species Act*, 2007).**

for their forest corridor habitat restoration work in the Long Point region of southwestern Ontario. OPG's program has received five different awards since its inception ranging from international through national through local recognition for conservation excellence.

Figure 8: OPG Tree Planting (2000 - 2008)




OPG is also working with the Toronto-based organization LEAF (Local Enhancement and Appreciation of Forests), which works with Toronto home owners to help enhance Toronto's urban forest. OPG is supporting their tree planting efforts and educational workshops. Their efforts have been well received by the public and it is helping to "green" the city. The benefits of planting urban trees are many and include the provision of shade and windbreaks to help reduce energy consumption for cooling and heating our homes. It also helps to improve our air quality by filtering pollutants, while reducing storm water run-off and providing urban wildlife habitat. The investment in urban forests is now seen as a critically important environmental initiative in most of our large urban communities.

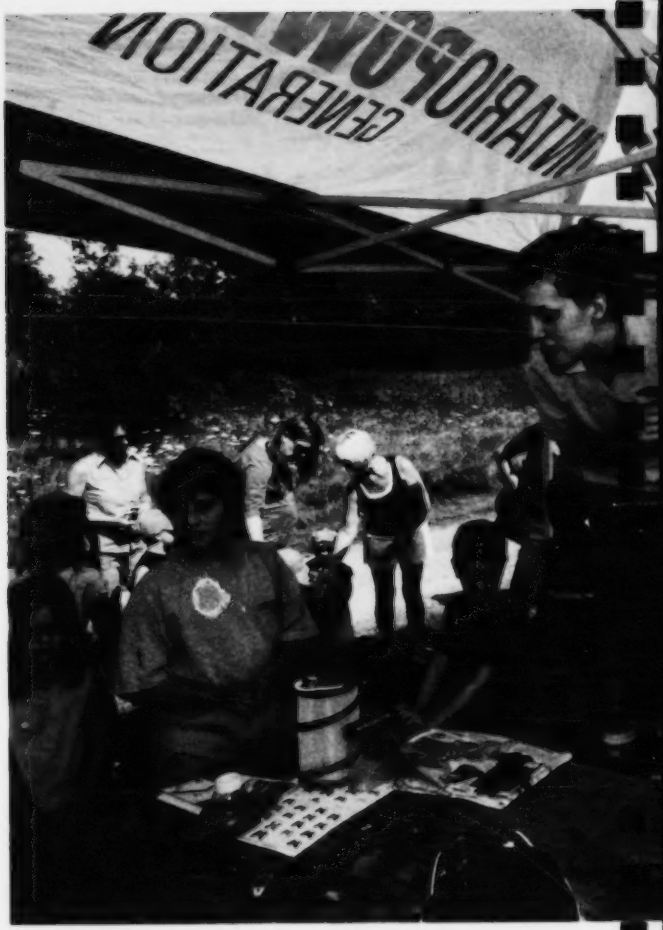
▲ OPG Vice President of Sustainable Development, Cara Clairman, with young tree planting recruits at an OPG tree planting event at Pickering GS.

## Community Partners in Pickering GS Biodiversity Programs - 2008

| Partnership | Activities/Involvement |
|---|---|
| **Toronto and Region Conservation Authority (TRCA)** | • Provides trees, shrubs and wildflowers for planting<br>• Provides advice and supervision for plantings<br>• Duffins Creek Marsh management and rehabilitation<br>• Environmental monitoring |
| **Frenchman's Bay Watershed Rehabilitation Project (this project has since been completed and has been succeeded by Environmental Stewardship Pickering)** | • Major community partner<br>• Planting events<br>• Educational events<br>• Environmental monitoring |
| **City of Pickering** | • Provides mulch for plantings<br>• Provides removal of invasive plant clippings<br>• Maintains Alex Robertson Park and Kinsmen Park<br>• Member of Environmental Stewardship Pickering |
| **Durham District School Board** | • Educational programs (e.g. Greensprouts)<br>• Participated in school yard plantings<br>• Participated in Earth Day events (tree plantings)<br>• Participated in interpretive hikes |
| **Durham Catholic District School Board** | • Participated in school yard plantings<br>• Participated in community tree plantings<br>• Planted wildflower gardens |
| **Dunbarton High School** | • Assisted with tree and shrub plantings and swallow bird box building |
| **Scouts Canada** | • Assisted with tree and shrub plantings |
| **Girl Guides of Canada** | • Assisted with tree and shrub plantings<br>• Participated in interpretive hikes |
| **856 Royal Canadian Air Cadet Squadron** | • Assisted with tree plantings in Alex Robertson Park |
| **Pickering Naturalists** | • Assisted with bird inventory and tree planting in Alex Robertson Park |
| **Pickering Horticultural Society** | • Assisted with tree planting in Alex Robertson Park |
| **Environmental Earth Angels** | • Schoolyard tree plantings |
| **Ducks Unlimited Canada** | • Provided wood duck nest boxes |

# Social Performance

OPG is committed to building quality relationships with our employees and external stakeholders. Most importantly, we strive to ensure that safety characterizes all aspects of our operations. We also believe that a good company gives back to its host communities, thus we support many charitable and not-for-profit initiatives in the communities where we operate.



▲ Pickering GS hosts Tuesdays on the Trail, Microscopia

## KEY AREAS OF SOCIAL PERFORMANCE

OPG pursues excellence relative to a host of social performance initiatives. The key initiatives are:

- Worker Safety
- Water Safety
- Employee Wellness
- Outreach and Recruitment: Generating a Future of Possibilities
- Diversity and Employment Equity: Part of Our Past, A Key Part of Our Future
- Code of Business Conduct
- Relationships with First Nations, and
- Corporate Citizenship Program (CCP)

OPG's commitment and performance, within each of these areas of focus, follows.

### Worker Safety

Overall, the company's safety performance was strong in 2008. A number of sites reached major safety milestones with no lost time injuries, demonstrating our progress towards reaching the goal of zero workplace injuries. OPG was also honoured with several prestigious safety awards within our industry - a Gold Award from the Electrical and Utilities Safety Association recognizing three years of sustaining an effective safety management system and strong safety culture and a Gold President's Safety Award from the Canadian Electricity Association for top quartile safety performance over three consecutive years (2005-2007).

OPG measures its workplace safety performance using two industry-recognized standards – Accident Severity Rate (ASR) and All Injury Rate (AIR). Performance in both categories was strong in 2008.

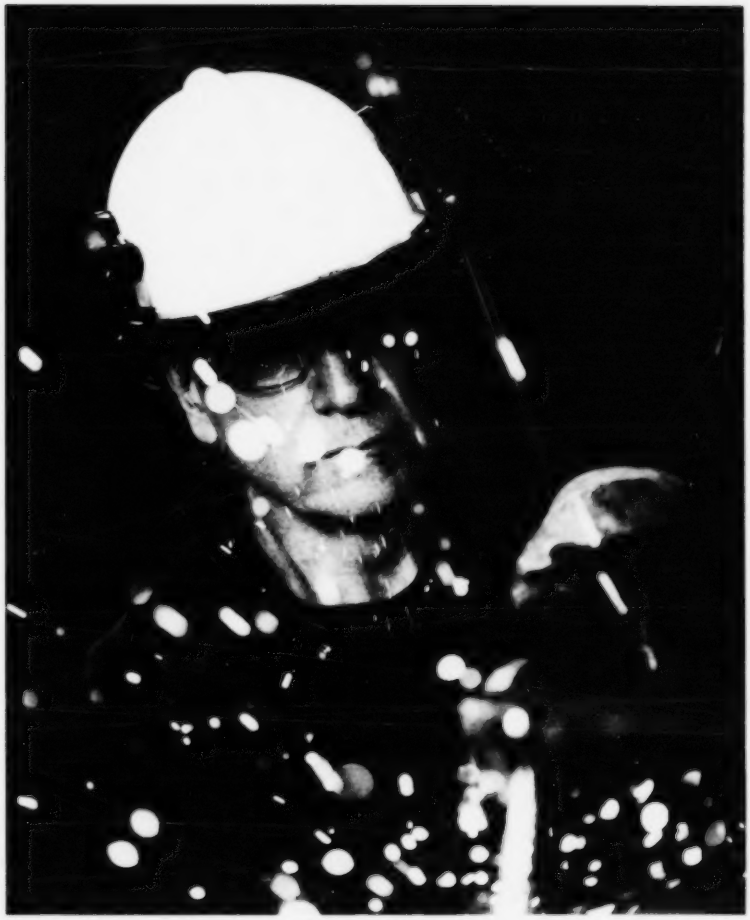
▲ Niagara Plant group employee performs grinding operation.

- OPG's 2008 ASR performance was the best in its history. During the year, OPG achieved an ASR of 1.47 days lost per 200,000 hours worked. This betters the company's strong 2007 ASR performance of 1.56 days lost per 200,000 hours worked.
- OPG's 2008 AIR was 1.15 injuries per 200,000 hours worked. While not quite as good as the company's 2007 AIR of 1.12 injuries per 200,000 hours worked, this was still the second best AIR in OPG's history.

As a company committed to performance excellence, we strive for the ultimate goal of zero injuries. OPG is committed to achieving this goal through further development of our strong safety culture and continuous improvement in our safety management systems and risk control programs. Under this plan, improvement programs were launched in several key areas:

## Social Performance

| | |
|---|---|
| **WORKER SAFETY** Accident Severity Rate (ASR) the best in OPG history at 1.47 days lost per 200,000 hours worked. | 1.47 Best ASR |
| **COMMUNITY SUPPORT** OPG supported almost 1000 registered charitable and non-profit initiatives including scholarship/student awards. | 1000 |
| **PARTNERSHIP** OPG signed a historic partnership agreement. Lac Seul First Nation now owns a 25 per cent equity stake in a generating station. | 25% |



▲ Niagara Plant group employee performs grinding operation.

- OPG's 2008 ASR performance was the best in its history. During the year, OPG achieved an ASR of 1.47 days lost per 200,000 hours worked. This betters the company's strong 2007 ASR performance of 1.56 days lost per 200,000 hours worked.
- OPG's 2008 AIR was 1.15 injuries per 200,000 hours worked. While not quite as good as the company's 2007 AIR of 1.12 injuries per 200,000 hours worked, this was still the second best AIR in OPG's history.

As a company committed to performance excellence, we strive for the ultimate goal of zero injuries. OPG is committed to achieving this goal through further development of our strong safety culture and continuous improvement in our safety management systems and risk control programs. Under this plan, improvement programs were launched in several key areas:

## Social Performance

**WORKER SAFETY**
Accident Severity Rate (ASR) the best in OPG history at 1.47 days lost per 200,000 hours worked.

1.47
Best ASR

**COMMUNITY SUPPORT**
OPG supported almost 1000 registered charitable and non-profit initiatives including scholarship/student awards.

1000

25%

- **Safety Leadership**: OPG believes that a strong safety culture is built on the safety leadership demonstrated by all employees. To build this leadership, OPG launched a "We are All Safety Leaders" communication campaign in 2008 which included a video and a series of poster featuring 20 employees from across OPG who deliver their message to their co-workers on what it means to be a safety leader both on the job and at home. The video demonstrates how all employees can contribute to OPG's strong safety culture by adhering to safety requirements and by showing safety leadership in their own way.

- **MSD Prevention Guideline**: Preventing Musculoskeletal Disorders (MSD) continues to be a major focus area for OPG. With over 40 per cent of OPG's injuries involving MSD injuries we have developed a requirement for enhanced MSD prevention programs to raise the bar in reducing MSD injuries. Programming improvements will be in the areas of employee involvement in making ergonomic changes, training, safety by design and building MSD hazard identification and control into day to day safe work planning.

- **Corporate Safety Rules**: OPG completed a revision of its Corporate Safety Rules in partnership with its unions, raising the bar on controlling our risks and preventing injuries. There was increased focus on making improvements in our key high risk areas including electrical safety, falling objects and driving safety.

- **Root Cause Investigation Improvements**: As part of OPG's commitment to continuous improvement, a major initiative was launched to develop more effective root cause investigation processes in order to improve lessons learned from safety incidents and prevent reoccurrences. This work continues into 2009 with a review of investigator training, root cause investigation techniques and corrective action development.

- **Joint Health and Safety Committee Conference**: In partnership with our unions, OPG organized a conference for over 300 OPG Joint Health and Safety Committee (JHSC) members, senior executives, managers, bargaining unit representatives and safety professionals from across the company. This was an excellent opportunity for JHSC members to meet and develop new skills and knowledge and share best practices.

- **Young Worker Safety**: In 2008, OPG continued to demonstrate leadership in safety through our commitment to young worker safety in the communities where we operate, participating in initiatives to raise awareness on the importance of workplace safety. As part of this effort, OPG executives partnered with young worker safety advocate, Rob Ellis and 60 other companies, to discuss workplace safety with over 80,000 students from 100 high schools in 50 Ontario cities. In addition, OPG is a sponsor of Passport to Safety, and together with the Society of Energy professionals co-sponsored a young worker safety forum at the Industrial Accident Prevention Association Conference. The forum was attended by more than 2,000 young adults.

- **Public Safety**: A commitment to Public Safety is an important part of the operation of OPG generating stations and is highlighted in OPG's Health and Safety Policy.

## Water Safety

OPG's dams and hydroelectric stations are located throughout the Province of Ontario. In fact, in Ontario alone there are more than 240 dams and 64 hydroelectric generating stations on 25 river systems. To help ensure public safety around all watercourses, OPG staff work closely with partners in site communities, and safety messages are broadly communicated to the public using television, radio, newspapers and magazine advertisements, as well as brochures, videos and a computer game for children.

In 2008, OPG entered into a partnership with the Ontario Provincial Police to promote safety around hydroelectric stations and dams. The partnership included grassroots improvements in enforcement of trespass as well as an effective television commercial featuring the OPP conveying our "Stay Clear – Stay Safe" message. OPG was also recognized for its efforts in the field of promoting waterways public safety through receipt of an award from the Canadian Safe Boating Council.

For the past several years OPG has utilized the results of a public attitude survey,

conducted in our site communities, to gauge the effectiveness of our advertising campaign to ensure the public understands the reasons they need to remain a safe distance from our facilities. The survey results clearly demonstrate the general public's support for OPG's initiatives in this important area of safety. As part of our continuous improvement effort OPG commissioned a major research study by the Center for Addiction and Mental Health to extend our knowledge to members of the public who voluntarily chose to take extreme risks by ignoring our warning signs and crossing our fencing, water booms and other barriers. The intent of the research is to develop appropriate means to reach voluntary risk takers in a manner which will effectively deter them. The results of the research are being shared with other dam owners and stakeholders in the health and safety field.

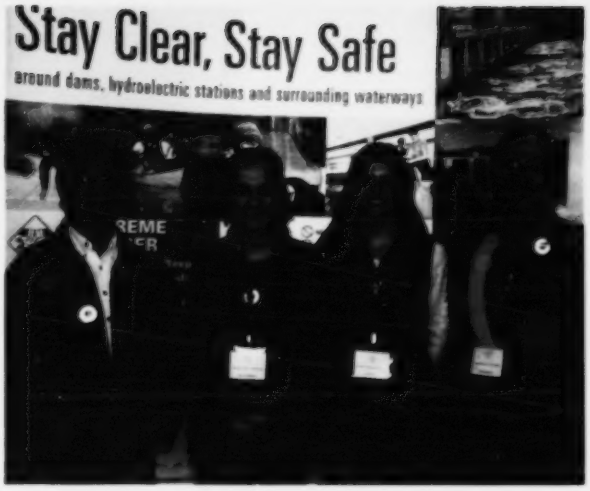
## Employee Wellness

OPG helps to ensure that employee wellness is supported through several initiatives and programs, such as:

- on-site fitness/work-out facilities at many locations help employees to maintain physical and mental well-being
- family assistance programs provide a range of counselling and referral services to those in need
- disability management is addressed through early intervention and ongoing support during periods of illness
- on-site flue shot clinics, blood pressure and cholesterol screening, health fairs, and a variety of related programs, address employee illness prevention and health awareness
- physicians and nurses are available across many sites, and
- mental health well-being and reducing negative stereotypes associated with mental health challenges is an ongoing priority for OPG. Accordingly, employees have access to various information services, including a mental health video library, mental health workshops, stress sensitivity seminars and a mental health website.

## Outreach and Recruitment: Generating a Future of Possibilities

As many as 1,400 employees at OPG are currently eligible to retire, and each year another 500 become eligible. By 2012, approximately 30 per cent of our workforce could retire. For some time now, OPG has realized the challenges presented by the demographics of an aging workforce, coupled with the reality of stiff competition for quality talent. In collaboration with others in the electricity sector, in education and in government, and in our unions, OPG is identifying workforce demand and supply issues and developing strategies to address potential shortfalls.




In 2008, OPG continued to expand its outreach and recruitment activities to universities and colleges across the province, and in Eastern Canada. We also ramped up our efforts to bring our message about future opportunities to younger students and disadvantaged students; our aim is to encourage young people to succeed in science and math programs that are a prerequisite to many careers at OPG. In this vein, OPG representatives regularly deliver information and advice through school and community programs, putting a face to our Learning Zone website (for students, parents and educators – middle and high school) and to new curriculum materials on electricity and how it's generated (Grades 6, 9 and 10). In addition, we are constantly exploring new ways of connecting with youth and are actively involved in helping shape a new high school program being developed by Ontario's Ministry of Education: the Specialist High Skills Major in Energy. At the other end of the education continuum, we are also encouraging enrollment in the provincial government's newly announced Second Career program, for the retraining of workers currently employed in, or laid off from, industries that are experiencing a downturn.

To further support and enhance our presence on campus, in schools and in the community, OPG developed and launched a new recruitment message in 2008. "Generate a Future of Possibilities" is the tag line for a set of key messages that reflect OPG, our values and why OPG is a great place to work. The messages underpinning this employment branding were based on consultations with a diverse group of employees, of various ages and at various stages of their careers. Research from various studies and feedback received through our front-line recruitment activities also factored into the development of our new messaging. In the end, we have a new look and new material featuring employees – from different parts of the company, different jobs and different backgrounds – sharing what they like about working at OPG. This message has been incorporated into all recruitment materials, including a brand

new eco-friendly, reusable bag that was a hit with student's at the 2008 Fall career fairs. The message is also front and centre on OPG's employment website – mypowercareer.com. In 2009, this website will be revamped to better reflect the new look, as well as to draw more traffic and attract more applicants to our job postings.

## Diversity and Employment Equity: Part of Our Past, A Key Part of Our Future

OPG's newly revised policy on Diversity and Human Rights underscores the importance of diversity, equity and inclusiveness at OPG. The Policy re-emphasizes our commitment to have a workforce representative of the communities in which we operate and aligns with our obligations under the federal *Employment Equity Act*. Moreover, the Policy provides overall direction in terms of ensuring we – as a company, and as individuals within our businesses – conduct ourselves in ways that are inclusive and respectful, creating work environments that are based on principles of dignity, equity and respect.

To support this Policy and its implementation, OPG's Corporate Diversity Committee and local site Diversity Committees collaborate on a wide range of education and change initiatives, bringing together management, unions and non-represented employee representatives. Other employee networks or resource groups, like OPG's Native Circle or the Durham chapter of Women in Nuclear, take on a big role as well, running information sessions or supporting programs to increase and retain a diverse workforce.

And it's clear we need this diversity of talent – now and in the future.

OPG participates in the Ontario Electricity Sector Council, and their 2008 labour market study (**www.brightfutures.com**) reports there is a growing threat of an insufficient supply of workers to meet the sector's needs. According to this study, internationally trained workers, women and Aboriginal people are unrepresented in the Canadian electricity sector. And people with disabilities are under-represented and under-employed across the board, in a wide range of sectors. Tapping into this resource base is an integral part of the strategy being pursued by OPG's Talent Management team. OPG recognizes the value of a diverse talent pool and is committed to broadening and deepening its current outreach efforts to help attract and retain a diverse employee base.

Every year, OPG participates in a wide range of community and recruitment events that target diverse groups. Some of these events, like the Annual Canadian Aboriginal Festival held in Toronto in November 2008, are on a national level. Other events have taken place throughout the province, and involve OPG representatives from local plants, working in collaboration with schools, settlement agencies or other community organizations. For example, the Pickering Diversity Committee organized an event to encourage OPG employees to mentor internationally trained workers in their search for employment, as well as to help in their transition to life in Canada. Every year, OPG employees and retirees provide this kind of valuable support to newcomers or others who need assistance in career planning and job search strategies, through mentoring programs, community events or work in schools.

OPG's support and outreach related to Diversity goes beyond participation in these types of events. We have also participated in studies, committees and roundtables trying to

### Code of Business Conduct

**The Code of Business Conduct defines OPG's culture by establishing the standards, expectations and accountabilities for appropriate business behavior. It is based on commitment to integrity, excellence and citizenship. Within the Code there are key non-negotiable values:**

- **respect for each other and our stakeholders**
- **respect for the environment, and**
- **commitment to the safety and health of our employees, contractors and the communities in which we work, live and serve.**

**Compliance to the Code is expected of everyone and employee accountabilities are outlined in the Code. Each of OPG's Executive Committee members is accountable for monitoring Code compliance within their business and for submitting an Annual Due Diligence Report to the Chief Ethics Officer. Introduction to the Code of Business Conduct training is a requirement for new employees as part of their orientation.**

▲ OPG Recruitment joins UOIT Career Day

▲ OPG Recruitment participates in the Canadian Aboriginal Festival.

identify and address barriers to employment for designated groups in education and in the broader workforce. Within OPG, we keep track of and report on Employment Equity statistics on hiring and promotion of designated groups, identifying barriers and developing strategies and programs to address issues related to any under-representation. One such program launched this year was the **EmPOWERed Women** program. This exciting new program – the first of its kind at OPG – is aimed at leveraging the experience and knowledge of OPG women, to help develop and train our future leaders. Reception to, and feedback from, the first session of this program confirmed that EmPOWERed women would continue to be offered and expanded in 2009.

A broad spectrum of Diversity programs and practices is reflected in OPG's Employment Equity Plan, providing a cornerstone for recruitment, retention and corporate citizenship strategies.

## Relationships with First Nations

Building strong and positive relationships with Ontario's First Nations communities is a critical aspect of OPG's hydroelectric development agenda. In 2008, OPG made good progress in advancing these relationships. Notably, in the Fall of 2008, OPG signed:

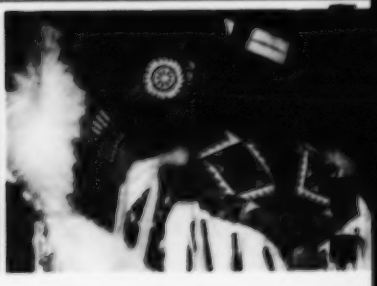
- a historic partnership agreement with the Lac Seul First Nation. This agreement sees Lac Seul First Nation owning a 25 per cent equity stake in the new Obishikokaang Waasiganikewigamig Generating Station (also known as the Lac Seul Generating Station).
- a protocol agreement for the participation of six First Nations in the definition phase of the Little Jackfish hydroelectric development.
- a settlement agreement with Red Rock First Nation to address past issues related to OPG facilities in and around the Lake Nipigon area.

▲ A historic partnership agreement was signed with the Lac Seul First Nation in the fall of 2008.

▼ Aboriginal day events at Darlington GS.

▼ June 19 Aboriginal dance held at Niagara Sir Adam Beck.

▼ Dancer performs at the Aborginal Day events in Niagara.



▼ Canadian Aboriginal Festival November 2008.

- a settlement agreement with the Mohawks of Akwesasne. Over 15 years of work by both staff and community members culminated in October, with the signing of a final settlement agreement with the Mohawks of Akwesasne. OPG Chairman Jake Epp delivered a formal apology to the Mohawks of Akwesasne addressing past wrongs associated with the building and operation of the R.H. Saunders Station 50 years ago. The agreement paves the way for a positive future between OPG and the Akwesasne community.

OPG's Northeast and Northwest Plant Groups were pleased to once again support the Lieutenant Governor's Aboriginal Youth Reading Camps. Staff from the Northwest Plant Group mentored the children, and presented computers and books to the children of the Wabaseemoong First Nation. The Northeast Plant Group participated in a similar event at Moose Cree First Nation.

In July 2008, OPG and the Ochiichagwe' babigo'ining Ojibway Nation celebrated the signing of an agreement that recognizes past wrongs associated with the construction and operation of Whitedog GS. OPG's Chairman Jake Epp delivered a well received apology to the First Nations community.

In support of the implementation of OPG's Aboriginal Policy, outlining our commitment to build and maintain positive relationships with Aboriginal Peoples in Ontario, work continues to implement the policy across all areas of OPG's business. The John Wesley Beaver Aboriginal Student Awards, two annual awards each equivalent to one year's tuition, are granted to deserving Native female and male students enrolled in post-secondary study. National Aboriginal Day celebrations were held at several OPG sites in June 2008, hosted by OPG's Native Circle, and supported by Corporate Diversity and Aboriginal Relations. The Native Circle helps build relationships between OPG and its Aboriginal employees, and with First Nation communities and the Metis.

## Corporate Citizenship Program (CCP)

As a primary employer in many Ontario communities, OPG takes seriously its responsibility to be a good corporate citizen and neighbour. We believe that good corporate citizenship is directly based on operating our electricity generating facilities in a safe, environmentally sound, productive and reliable manner. We also believe that a good company gives back to the communities in which it operates, clearly making a difference in the quality of life in those communities.

OPG, through its Corporate Citizenship Program (CCP), helps make a difference by supporting a variety of charitable and non-profit initiatives in the communities where we operate. Our CCP provides both donation and sponsorship support to initiatives where OPG and our host communities have special interest. This includes initiatives that are innovative and are consistent with the company's commitment to be an engaged and productive member of the community. Ultimately this means minimizing our impact on the environment and ensuring that our contribution to the broader community is consistently positive.

Consistent with this commitment, OPG's CCP focuses on small grass roots contributions in the primary focus areas of environment, education and community (health and safety, arts and cultural, humanitarian, and youth amateur sports initiatives). In 2008, OPG's CCP provided support to almost 1,000 registered charitable and non-profit initiatives including scholarships / student awards.

Below are a few examples of OPG's citizenship efforts in the community:

**ENVIRONMENT**: OPG supports a healthier environment for future generations by providing support to innovative environmental initiatives and partnerships that look at solutions - ones that focus on wildlife and habitat restoration, naturalization, biodiversity, recycling and environmental education. OPG sites support a variety of environmental education programs and OPG's Darlington GS has had an on-going partnership since 1999 with Courtice Secondary School involving the monitoring of bird boxes on the Darlington Waterfront Trail, Earth Day clean-up activities and more recently development of a butterfly garden at Darlington GS's Public Information Centre.

**EDUCATION**: In 2008, OPG's hydroelectric staff was once again given warm welcomes from the First Nation communities of Moose Cree (Northeastern Ontario) and Wabaseemoong (Northwestern Ontario) during "Reading is Cool" events held this past summer. The events were an extension of OPG's support of the Lieutenant Governor of Ontario's Annual Aboriginal Youth Summer Reading Camp Program. The program helps build the English literacy skills of Aboriginal youth living in remote First Nations communities. The curriculum for the camps was designed by Frontier College, a national, non-profit literacy organization founded in 1899 with a strong history of delivering successful literacy programs. Curriculum includes reading and writing skill development, literacy activities and community specific content such as story-telling, music, arts and crafts. The OPG "Reading is Cool" camp events at both Moose Cree First Nation and Wabaseemoong First Nation included reading, mentoring and a BBQ lunch cooked up by OPG staff for campers and community members. After lunch the children received a special donation from OPG of computer workstations for their school computer labs noting the importance of both reading and computer learning.

**COMMUNITY INITIATIVES**: In 2008, OPG had over 250 youth amateur sports teams / initiatives under sponsorship representing thousands of youth (under 18) in our host communities that are playing on OPG sponsored teams and in OPG sponsored tournaments / competitions for hockey, baseball, lacrosse, basketball, soccer, ringette, ball hockey, as well as figure skating, gymnastics and swimming.

# Economic Performance

OPG creates value for the government and residents of Ontario that complements our commitment to ensure a reliable supply of electricity.

## KEY AREAS OF ECONOMIC PERFORMANCE

OPG strives to bring value to Ontario, the communities in which we operate, and to its employees, through a variety of responsible "best business" practices. Accordingly, key areas of focus for OPG include:

- OPG's Financial Strength Benefits Ontario
- New Hydroelectric Projects will Provide More Clean Energy
- New Nuclear and Refurbishment will Ensure Reliable and Virtually Emissions-free Electricity
- New Fossil: As Coal is Phased Out, New Energy Sources Emerge
- Well Maintained Assets Enhance Reliability
- Employee Compensation and Provincial Payments
- Purchase of Goods and Services
- OPG Ventures Inc.

OPG's commitment and performance, within each of these areas of focus, follows.

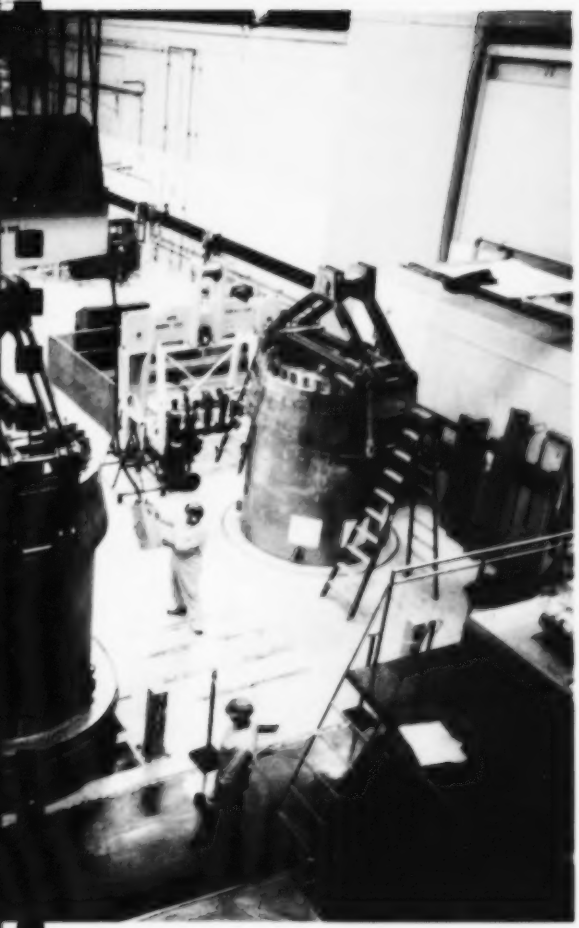
▲ Pickering GS 941Outage work in October 2008.

### OPG's Financial Strength Benefits Ontario

OPG's 2008 net income was $88 million, compared to its 2007 net income of $528 million. The decline was primarily due to the effects of the global economic downturn, which had a negative impact on the current value of OPG's Nuclear Decommissioning Fund.

Reflecting the overall efficiency of OPG's operations in 2008, OPG's income before interest and income taxes from its electricity generating segments exceeded $1 billion, compared to $594 million in 2007. Several factors drove this strong performance:

- higher market prices
- higher nuclear and hydroelectric generation; and
- an increase in gross margin due to the Ontario Energy Board's (OEB) decision regarding new payment amounts for OPG's regulated hydroelectric and nuclear facilities.



▲ Laboratory testing for Pickering B P871 Unit 7 Outage

**NEW RATE STRUCTURE**: In December 2008, the OEB issued new regulated prices for production from OPG's regulated baseload hydroelectric and nuclear facilities. The new regulated prices are based on a return on equity (ROE) of 8.65 per cent, which was determined by the OEB. Prior to April 1, 2008, OPG's ROE was established – on an interim basis – at about five per cent. The new rate structure will enable OPG to undertake upgrades and improvements to its low emission regulated facilities for the benefit of all Ontarians.

**OPG WILL NOT SEEK RATE INCREASE IN 2009**: The current prices which OPG receives for power from its nuclear stations and baseload hydroelectric operations are set by the OEB. These regulated prices will remain at current levels for an extra year. OPG will not seek an increase for 2010 in the rates that are in effect for electricity from its regulated assets.

## Economic Performance

**OPG INCOME**
OPG income from its electricity generating segments, before interest and income taxes exceeded $1 billion.

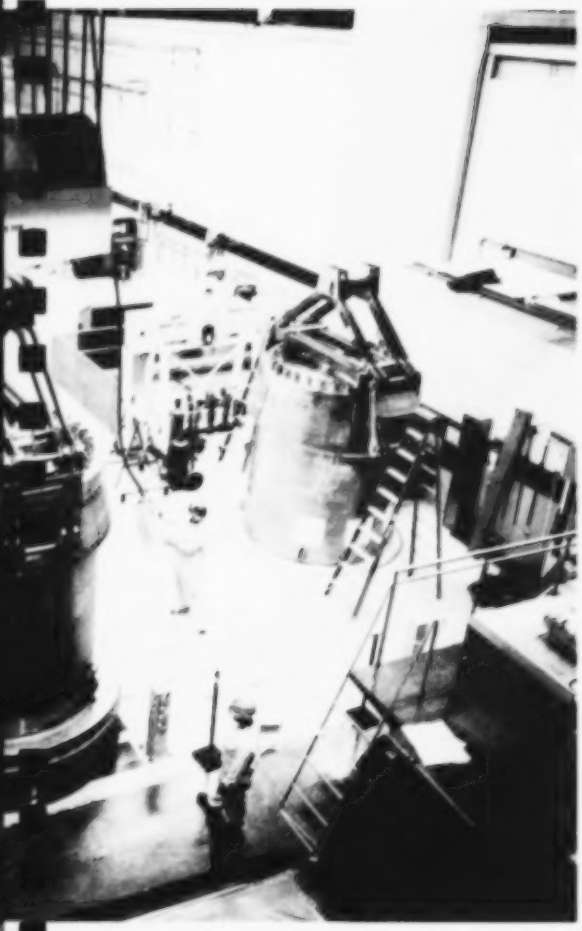
$1 billion
OPG income

**NEW HYDROELECTRIC**
New projects in northern Ontario are in various stages of development and represent almost 600 MW of new hydroelectric supply.

600 MW
New Hydroelectric

**RATE INCREASE**
OPG will not seek a rate increase for 2010. Rates in effect for regulated assets are set by the OEB.

0%
rate increase



▲ Laboratory testing for Pickering B P&T1 Unit 7 Outage

**NEW RATE STRUCTURE**: In December 2008, the OEB issued new regulated prices for production from OPG's regulated baseload hydroelectric and nuclear facilities. The new regulated prices are based on a return on equity (ROE) of 8.65 per cent, which was determined by the OEB. Prior to April 1, 2008, OPG's ROE was established – on an interim basis – at about five per cent. The new rate structure will enable OPG to undertake upgrades and improvements to its low emission regulated facilities for the benefit of all Ontarians.

**OPG WILL NOT SEEK RATE INCREASE IN 2009**: The current prices which OPG receives for power from its nuclear stations and baseload hydroelectric operations are set by the OEB. These regulated prices will remain at current levels for an extra year. OPG will not seek an increase for 2010 in the rates that are in effect for electricity from its regulated assets.

## Economic Performance

**OPG INCOME**
OPG income from its electricity generating segments, before interest and income taxes exceeded $1 billion.

$1 billion
OPG income

**NEW HYDROELECTRIC**
New projects in northern Ontario are in various stages of development and represent almost 600 MW of new hydroelectric supply.

600 MW
New Hydroelectric

## New Hydroelectric Projects Will Provide More Clean Energy

OPG continued to make progress on its mandate to expand Ontario's hydro power supply. By the end of the year, construction of OPG's newest generating facility – the Lac Seul hydroelectric station – was complete, and it officially entered service in early 2009. The Niagara Tunnel ended the year one-third of the way through its 10.4-kilometre journey under the City of Niagara Falls. Progress was difficult due to unstable rock conditions, which will delay the scheduled completion date and increase project costs. When finished, the Tunnel will provide Ontario with 1.6 TWh of additional clean energy per year for more than 90 years.

In 2008, OPG also began design and construction work on the redevelopment of four of its existing stations on the Upper Mattagami and Montreal Rivers in northeastern Ontario. Two of these stations have already been demolished. The project will increase the stations' capacity from 23 MW to 44 MW.

OPG has undertaken several other new hydro projects in northern Ontario. The projects are in various stages of development and represent almost 600 MW of potential new hydroelectric supply for Ontario. This includes a major project involving four hydro stations on the Lower Mattagami River. OPG is proceeding with a development plan to increase the capacity of these stations by 450 MW.

## Plug'n Drive Ontario

OPG has been instrumental in the development of Plug'n Drive Ontario. This initiative reflects a partnership of Ontario-based companies, auto manufacturers, government agencies and researchers. Plug'n Drive Ontario is dedicated to ensuring that Ontario will be ready for a new generation of low-emission plug-in vehicles.

## New and Refurbished Nuclear Will Ensure Reliable And Virtually Emissions-Free Electricity

**NEW NUCLEAR AT DARLINGTON GS**: OPG's reputation as a capable nuclear operator was confirmed in June 2008, when the Ontario government chose OPG to operate two new nuclear units at its Darlington GS site. The government has set a target in-service date of 2018 for the first unit and 2019 for the second unit. OPG is participating in the government-led process to select the reactor technology and a preferred vendor to construct the new reactors.

**DARLINGTON GS REFURBISHMENT**: Work began on assessing the business case for refurbishing the Darlington nuclear station. By the end of 2008, OPG had completed a technical assessment of the station's steam generators. In 2009, OPG will undertake additional activities – including more technical assessments, development of a draft refurbishment outage plan and continuation of an Integrated Safety Review. Similar to the Pickering B refurbishment process, OPG will proceed with Darlington's refurbishment only if it is justified by a solid business case and approved by OPG's Board of Directors.

Refurbishing Darlington GS will enable the 3,500 MW station to continue to meet Ontario's electricity needs for decades to come.

**PICKERING B GS REFURBISHMENT**: In January 2009, OPG was informed by the Canadian Nuclear Safety Commission that the refurbishment and continued operation of the Pickering B nuclear station is not likely to cause significant adverse environmental effects, taking into account the identified mitigation measures. This was an important milestone for the refurbishment project. OPG continues to assess the business case for Pickering B's refurbishment. Factors under consideration include total costs and post-refurbishment production levels.

## New Fossil: As Coal Is Phased Out, New Energy Sources Emerge

OPG has been directed by the Ontario government to stop burning coal at its fossil-fuelled stations by the end of 2014. To help ensure Ontario continues to have a flexible, reliable source of energy to meet its needs, OPG is developing and exploring new opportunities in natural-gas generation and renewable, carbon-neutral biomass fuel.

**PORTLANDS ENERGY CENTRE**: In partnership with TransCanada Energy, OPG completed the first phase of the 550 MW Portlands Energy Centre in May 2008 – online, on time, and on budget. Portlands will increase the reliability and security of electricity supply in downtown Toronto.

**BIOMASS**: Throughout 2008, OPG continued to explore the feasibility of burning biomass fuel in some of its coal units. Successful test burns were conducted on units at Nanticoke GS and Atikokan GS stations. These included tests in which 100 per cent biomass fuel was burned for prolonged periods – proving that the fuel is technically capable of replacing coal. Tests were also conducted at Lambton GS. OPG will not use food crops when burning biomass, and the wood fuel it uses for biomass must be from forests subject to sustainable harvest practices. Biomass has the potential to create a new Ontario based industry. While test results have been promising, more studies are needed to determine whether biomass is a practical commercial option.

## Well Maintained Assets Enhance Reliability

OPG operates a wide range of both newly constructed and established generating facilities across Ontario. Proactive improvement programs, regular maintenance and targeted equipment upgrades keep these assets operating at high levels of efficiency and reliability.

**NUCLEAR PLANNED OUTAGES**: Planned outages are an important tool for maintaining and improving nuclear performance. OPG completed three major planned outages on nuclear units at Pickering GS and Darlington GS in 2008. These outages accomplished important maintenance and upgrade work, enhancing reactor efficiency and performance. The two outages at Pickering GS were completed behind schedule. The Darlington GS outage – on Unit 1 – was completed ahead of schedule. With the completion of this outage all four units at Darlington GS now operate on a three year outage cycle. Most other nuclear plants worldwide operate on a two year cycle. The new cycle will help improve Darlington GS's reliability and output.

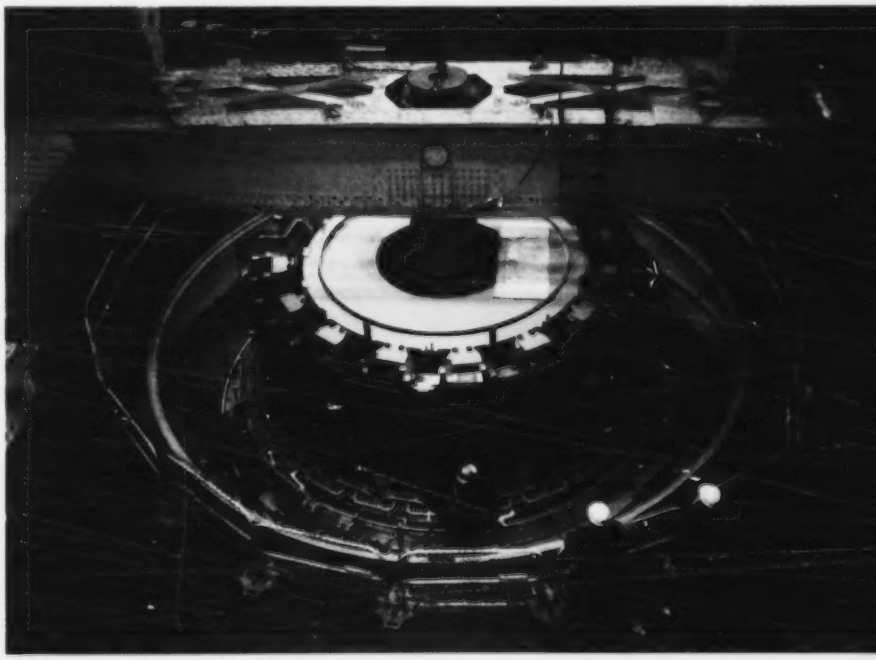
**HYDRO IMPROVEMENTS CONTINUE**: Performance upgrades took place at many of OPG's hydroelectric stations. Major outages were completed at Chats Falls, Des Joachims, Abitibi Canyon, Otto Holden and Stewartville GS. Several of these outages enabled OPG to increase its hydroelectric energy output by 13.8 GWh – enough energy to power about 1,400 households for one year. Over the next five years, OPG plans to increase the capacity of its existing hydro stations by 87 MW, as part of its ongoing program to replace existing turbine runners with more efficient equipment. Since 1999, this program has added 254 MW of clean, renewable hydropower to Ontario's electricity supply – about the same amount of capacity as a small gas-fired station.

**ENSURING FOSSIL PLANTS ARE READY**: In 2008, OPG invested in its fossil fleet to ensure safe and reliable operation when required – accordingly, a total of 24 major planned outages took place at OPG fossil stations. Effective maintenance enabled the stations to be in a high state of readiness throughout the summer. From June through August, Fossil's Forced Outage Rate – a key reliability measure – was under eight per cent. This was a 30 per cent improvement over the same period in 2007.

To comply with Ontario's new carbon dioxide emission requirements taking effect in 2009, OPG will produce less electricity from its fossil plants. Our maintenance approach will be to ensure that the plants continue to be reliable during peak demand times in the summer and winter months – with reduced operations during periods of lower demand.

▼ Pickering B P871 Unit 7 Outage work.

▼ New G7 turbine replacement work at Niagara Plant Group's Sir Adam Beck I.

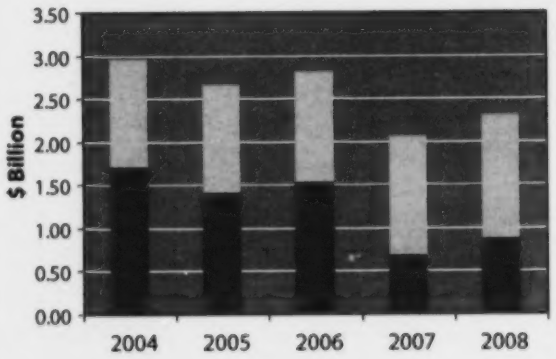


## Employee Compensation and Provincial Payments

In ongoing efforts to attract and retain a highly qualified workforce, OPG offers employees competitive compensation. In 2008, compensation to OPG employees totaled approximately $1.44 billion (see Figure 9). Recognizing that most OPG employees live in Ontario and purchase their goods and services locally, this compensation directs a substantial transfer of wealth back to the province.

OPG creates additional benefit for the provincial economy through payments made in lieu of taxes, gross revenue charges (including water rental payments*), dividends, interest on long term debt, Market Power Mitigation Agreement Rebates**, Revenue Limit Rebate (ONPA) and other payments to the Province of Ontario (see Figure 9). In 2008, these payments totaled nearly $0.88 billion (see notes, Figure 9).

**Figure 9: OPG Salaries and Payments made to the Province of Ontario**




OPG Employee Salaries

Payments in Lieu of Taxes, Gross Revenue Charges (incl. Water Rental Payments*), Dividends, Interest on Long Term Debt, Market Power Mitigation Agreement Rebate**, Revenue Limit Rebate (ONPA)*** and other payments to the Province of Ontario.

* This amount only includes water rentals charged under the Gross Revenue Charge (GRC) regime. Therefore, it does not include amounts charged for non-provincial water rentals.

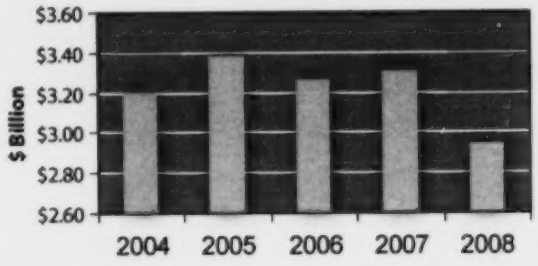
** Replaced by ONPA (Revenue Limit Rebate) effective April 1, 2005.

*** ONPA - OPG Non-Prescribed Asset Rebate, now referred to as the OPG Rebate, effective April 1, 2005.

## Purchase of Goods and Services

OPG provides support to the Province of Ontario through the purchase of goods and services. In 2008, the total purchase of goods and services in Ontario by OPG totaled $2.95 billion (see Figure 10).

**Figure 10: Total Purchase of Goods and Services by OPG within Ontario***



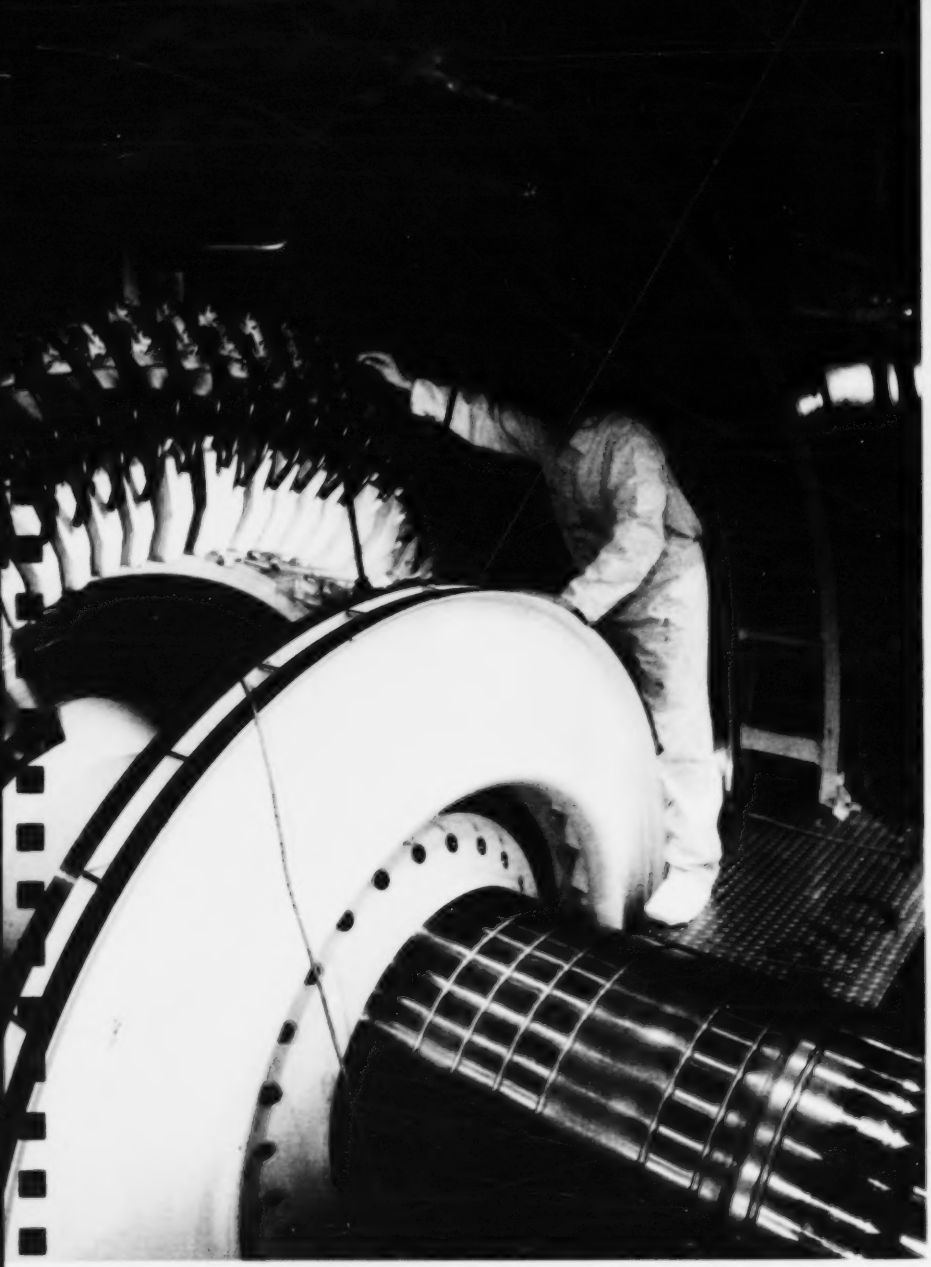

*2004-2006 figures restated from SD Report 2006 .

## OPG Ventures Inc.

Through its wholly owned corporate venture capital group, OPG Ventures Inc. (OPGV), OPG continues to manage a portfolio of investments in enterprises developing and commercializing leading-edge energy technologies. OPGV was established to invest in private companies developing or commercializing emerging energy technologies for the purposes of yielding financial returns and strategic benefits for OPG.

Since it was established in 2001, OPG Ventures has invested directly and indirectly in small private companies developing technologies that generate, transmit, store, transact or utilize electricity more efficiently, more cost effectively and in cases with reduced environmental impact. As of the end of 2008, the fair value of the entire investment portfolio was about $40 million.

Given OPG's current mandate to focus on its core generation business, OPG Ventures has scaled back its investment activities to meeting existing commitments and making selective follow-on investments with a view to monetizing the investment portfolio in a manner that optimizes the return to OPG.



## Stakeholder Feedback

In 2008, and ongoing into 2009, OPG engaged Canadian Business for Social Responsibility (CBSR) to perform a sustainable development stakeholder mapping exercise. The mapping exercise will help OPG to identify gaps that may exist in its key sustainable communiqué, the Annual Sustainable Development Report. Results from the mapping exercise will be available Summer, 2009, and changes deemed necessary based on input from CBSR will be reflected in the Sustainable Development 2009 Report.

Consistent with OPG's mandate for continuous improvement, please submit any comments/suggestions you may have regarding this report to Cara Clairman, Vice President Sustainable Development, at the coordinates provided on the back cover of this report.

# Appendix A

## Nuclear

### General Information

#### Pickering A & B GS

**Generation capacity:**
**Pickering A: 1,030 MW net**
**Pickering B: 2,064 MW net**

Located on Lake Ontario in the city of Pickering, each generating station has 4 units. Two of the 515 MW Pickering A units taken out of service during the nuclear recovery program will not be refurbished.

Number of used fuel bundles stored on site: 619,310

Tel: (905) 839-1151

| Generation (net GWh) | | | | | Critical Group Dose (μSv) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2008 | 2007 | 2006 | 2005 | 2004 | 2008 | 2007 | 2006 | 2005 | 2004 |
| 19,123 | 16,855 | 19,801 | 17,297 | 15,672 | 4.1 | 2.6 | 3.6 | 6.8 | 4.1 |

#### Darlington GS

**Generation capacity:**
**3,512 MW net**

Located on Lake Ontario in the municipality of Clarington, 70 km east of Toronto. This generating station has 4 units.

Number of used fuel bundles stored on site: 370,852

Tel: (905) 623-6670

| Generation (net GWh) | | | | | Critical Group Dose (μSv) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2008 | 2007 | 2006 | 2005 | 2004 | 2008 | 2007 | 2006 | 2005 | 2004 |
| 28,840 | 27,155 | 26,968 | 27,491 | 26,486 | 1.3 | 1.4 | 1.2 | 0.9 | 1.2 |

- Ontario Power Generation for the years ended December 31
- Totals may not add up due to rounding

## Fossil

### Atikokan GS

**Generation capacity: 211 MW net**

Located west of Thunder Bay, the station has 1 coal-fired unit equipped with low-$NO_x$ burners.

| General Information | Net Generation and Emissions* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Generation (net GWh) | | | | | Emissions (tonnes) | | | | | |
| | 2008 | 2007 | 2006 | 2005 | 2004 | | 2008 | 2007 | 2006 | 2005 | 2004 |
| Atikokan GS | 313 | 651 | 737 | 965 | 1,018 | $SO_2$ | 1,613 | 2,999 | 3,304 | 4,774 | 6,430 |
| | | | | | | $NO_x$ | 757 | 1,192 | 1,435 | 1,701 | 2,240 |
| | | | | | | $CO_2$ | 415,000 | 751,000 | 849,400 | 1,104,000 | 1,177,200 |
| Lambton GS | 6,544 | 8,855 | 6,856 | 9,422 | 7,672 | $SO_2$ | 18,115 | 30,796 | 17,227 | 29,343 | 25,907 |
| | | | | | | $NO_x$ | 6,444 | 9,205 | 6,179 | 8,804 | 8,100 |
| | | | | | | $CO_2$ | 6,373,000 | 8,459,000 | 6,451,000 | 8,692,000 | 7,169,900 |
| Lennox GS | 278 | 789 | 317 | 1,263 | 602 | $SO_2$ | 405 | 899 | 623 | 2,503 | 2,449 |
| | | | | | | $NO_x$ | 354 | 936 | 420 | 1,554 | 1,016 |
| | | | | | | $CO_2$ | 264,000 | 583,000 | 281,720 | 953,530 | 613,000 |
| Nanticoke GS | 15,329 | 18,083 | 16,174 | 17,666 | 14,466 | $SO_2$ | 52,720 | 67,423 | 61,958 | 67,946 | 61,256 |
| | | | | | | $NO_x$ | 20,087 | 22,376 | 20,048 | 22,942 | 21,065 |
| | | | | | | $CO_2$ | 15,412,000 | 17,868,000 | 16,222,800 | 17,580,000 | 14,671,800 |
| Thunder Bay GS | 702 | 590 | 959 | 962 | 965 | $SO_2$ | 2,528 | 2,530 | 4,163 | 4,215 | 5,035 |
| | | | | | | $NO_x$ | 1,820 | 1,550 | 2,701 | 2,632 | 2,498 |
| | | | | | | $CO_2$ | 800,000 | 706,000 | 1,127,620 | 1,149,600 | 1,126,000 |

### Lambton GS

**Generation capacity: 1,920 MW net**

Located on the St. Clair River south of Sarnia, the station has 4 coal-fired units, 2 of which are equipped with $SO_2$ scrubbers and selective catalytic reduction (SCR) equipment to reduce $NO_x$ emissions.

### Lennox GS

**Generation capacity: 2,100 MW net**

Located on Lake Ontario in the town of Greater Napanee. The station has 4 oil and/or natural gas-fired units.

### Nanticoke GS

**Generation capacity: 3,640 MW net**

Located on Lake Erie, the station has 8 coal-fired units fitted with low-$NO_x$ burners, 2 of which are equipped with selective catalytic reduction (SCR) equipment to reduce $NO_x$ emissions.

### Thunder Bay GS

**Generation capacity: 306 MW net**

Located in Thunder Bay, this station has 2 coal-fired units.

* $NO_x$ is reported as $NO_2$.

## Hydroelectric

| General Information | Net Generation and Emissions* | | | | |
|---|---|---|---|---|---|
| **Niagara Plant Group** | Generation (net GWh) | | | | |
| | **2008** | **2007** | **2006** | **2005** | **2004** |
| **Generation Capacity: 2,287 MW**<br>Includes 5 stations, Head Quarters (HQ) in Niagara area | 11,907 | 11,530 | 11,538 | 12,526 | 12,597 |
| **Ottawa/St. Lawrence Plant Group** | Generation (net GWh) | | | | |
| | **2008** | **2007** | **2006** | **2005** | **2004** |
| **Generation Capacity: 2,571 MW**<br>Includes 10 stations, HQ in Renfrew | 13,873 | 11,484 | 13,133 | 11,869 | 13,002 |
| **Northeast Plant Group** | Generation (net GWh) | | | | |
| | **2008** | **2007** | **2006** | **2005** | **2004** |
| **Generation Capacity: 1,294 MW**<br>Includes 13 stations, HQ in Timmins | 5,112 | 4,562 | 4,552 | 4,109 | 5,320 |
| **Northwest Plant Group** | Generation (net GWh) | | | | |
| | **2008** | **2007** | **2006** | **2005** | **2004** |
| **Generation Capacity: 661 MW**<br>Includes 10 stations, HQ in Thunder Bay | 4,894 | 3,865 | 3,355 | 4,426 | 4,852 |
| **Central Hydro(1)** Central Hydro EcoLogo™-certified | Generation (net GWh) | | | | |
| **Generation Capacity: 147 MW**<br>HQ in North Bay | **2008** | **2007** | **2006** | **2005** | **2004** |
| EcoLogo™-certified Green Power generation capacity from 32 OPG stations (29 small hydro stations including 4 NEPG stations), 2 wind turbines, and 50% of Huron Wind (5 wind turbines, partnership with a consortium of Canadian companies): 134 MW (at Dec 31, 2008) | 693 | 620 | 742 | 623 | 709 |
| EcoLogo™-certified Green Power capacity available from Power Purchase Agreements. | 0 | 12 | 50 | 37 | 47 |
| Total available EcoLogo™-certified Green Power capacity: 134 MW (at Dec 31, 2008) | 693 | 632 | 792 | 660 | 756 |
| **Other Central Hydro capacity** | Generation (net GWh) | | | | |
| Other Central Hydro capacity (non-EcoLogo: Eugenia Falls hydroelectric station: 6.1 MW; New York Wind Farm: 6.6 MW) | 46 | 38 | 33 | 41 | 38 |

(1) formerly Evergreen Energy

# Appendix B

| Indicator | | | | | |
|---|---|---|---|---|---|
| **ENERGY GENERATION BY SOURCES (gross GWh)** | **2008** | **2007** | **2006** | **2005** | **2004** |
| **Fossil** | 24,807 | 30,741 | 26,756 | 32,816 | 28,921 |
| **Hydroelectric** (Renewable - excl. Evergreen Energy) | 36,305 | 31,754 | 32,977 | 32,418 | 35,384 |
| **Nuclear** | 51,140 | 47,003 | 49,763 | 47,810 | 45,051 |
| **Central Hydro** (formerly Evergreen Energy includes 4 NE Plant Group stations) | 726 | 669 | 825 | 701 | 795 |
| **Total Internal Energy Generated** | 112,978 | 110,168 | 110,322 | 113,746 | 110,150 |

| **ENERGY GENERATION BY SOURCE (net GWh)** | **2008** | **2007** | **2006** | **2005** | **2004** |
|---|---|---|---|---|---|
| **Fossil** | 23,165 | 28,969 | 25,042 | 30,938 | 27,020 |
| **Hydroelectric** (Renewable - excl. Central Hydro) | 35,724 | 31,339 | 32,475 | 31,912 | 35,017 |
| **Nuclear** | 48,182 | 44,010 | 46,769 | 45,005 | 42,158 |
| **Central Hydro** (formerly Evergreen Energy; includes 4 NE Plant Group stations, wind, power purchases) | 726 | 670 | 825 | 701 | 795 |
| **Total Internal Energy Output** (incl. power purchases) | 107,797 | 104,987 | 105,098 | 108,543 | 104,974 |

| **ENERGY CONVERSION EFFICIENCY OF FOSSIL GENERATING STATIONS** | **2008** | **2007** | **2006** | **2005** | **2004** |
|---|---|---|---|---|---|
| **Total Energy Input** (GWh equiv.) | 70,940 | 86,337 | 75,760 | 92,986 | 82,823 |
| **Net Energy Output** (GWh) | 23,165 | 28,969 | 25,042 | 30,938 | 27,020 |
| **Fuel Conversion Efficiency** (%) | 32.7% | 33.6% | 33.1% | 33.3% | 32.6% |

| **OPG INTERNAL ENERGY EFFICIENCY** | **2008** | **2007** | **2006** | **2005** | **2004** |
|---|---|---|---|---|---|
| **Gross Generation** (GWh) | 112,978 | 110,168 | 110,308 | 113,732 | 110,135 |
| **Net Generation** (GWh) | 107,797 | 104,987 | 105,098 | 108,543 | 104,974 |
| **Generation Energy Efficiency** (%) | 95.41% | 95.30% | 95.28% | 95.44% | 95.31% |
| **Internal Energy Saving** - Cumulative since 1994 (GWh/yr) | 2,405 | 2,389 | 2,234 | 2,111 | 2,054 |
| **Avoided $CO_2$, $NO_x$ (as $NO_2$) and $SO_2$** (tonnes) | 2,410,238 | 2,350,811 | 2,234,700 | 2,071,357 | 2,070,215 |
| **$ Value of Energy Savings @ market clearing rate** (2007 - 2008 = 4.6¢/kwh; 2006 = 4.63¢/kwh; 2005 = 4.6¢/kwh; 2004 = 4.3¢/kwh) | $114,458,089 | $109,890,398 | $103,431,501 | $97,123,940 | $88,318,130 |
| **Annual Incremental Energy Saving** (% of internal energy use) | 0.3% | 3.0% | 2.4% | 1.1% | 2.1% |
| **Annual Incremental Energy Saving** (GWh/yr) | 15.7 | 155.0 | 122.6 | 57.5 | 107.4 |

| Indicator | | | | | |
|---|---|---|---|---|---|
| **ATMOSPHERIC EMISSIONS - FOSSIL** | **2008** | **2007** | **2006** | **2005** | **2004** |
| Total Gross Annual $CO_2$ Emissions (tonnes) | 23,264,000 | 28,366,000 | 24,932,840 | 30,198,130 | 27,077,400 |
| Total Gross Annual $SO_2$ Emissions (tonnes) | 75,382 | 104,647 | 87,275 | 113,642 | 116,913 |
| Total Gross Annual $NO_x$ Emissions (tonnes, as $NO_2$) | 29,462 | 35,261 | 30,783 | 39,043 | 39,847 |
| **EMISSION RATES - FOSSIL** | **2008** | **2007** | **2006** | **2005** | **2004** |
| $CO_2$ Emissions (tonnes/GWh-net) | 1004 | 979 | 996 | 976 | 1002 |
| $SO_2$ Emissions (tonnes/GWh-net) | 3.25 | 3.61 | 3.49 | 3.67 | 4.33 |
| $NO_x$ Emissions (tonnes/Gwh-net, as $NO_2$) | 1.27 | 1.22 | 1.23 | 1.26 | 1.47 |
| **ATMOSPHERIC EMISSIONS - NUCLEAR** | **2008** | **2007** | **2006** | **2005** | **2004** |
| Total Gross Annual $CO_2$ Emissions (tonnes) | 6,289 | 15,428 | 6,271 | 11,459 | 7,247 |
| Total Gross Annual $SO_2$ Emissions (tonnes) | 0.6 | 3 | 1 | 2 | 20 |
| Total Gross Annual $NO_x$ Emissions (tonnes, as $NO_2$) | 26 | 85 | 23 | 64 | 144 |
| **ATMOSPHERIC EMISSIONS - OPG** | **2008** | **2007** | **2006** | **2005** | **2004** |
| Total Gross Annual $CO_2$ Emissions (tonnes) | 23,270,289 | 28,381,428 | 24,939,111 | 30,210,459 | 27,084,647 |
| Total Gross Annual $SO_2$ Emissions (tonnes) | 75,383 | 104,650 | 87,276 | 113,645 | 116,933 |
| Total Gross Annual $NO_x$ Emissions (tonnes, as $NO_2$) | 29,488 | 35,346 | 30,806 | 39,107 | 90,067 |
| **EMISSION RATES - TOTAL OPG** | **2008** | **2007** | **2006** | **2005** | **2004** |
| $CO_2$ Emissions (tonnes/GWh-net) | 216 | 270 | 237 | 278 | 258 |
| $SO_2$ Emissions (tonnes/GWh-net) | 0.70 | 1.00 | 0.83 | 1.05 | 1.11 |
| $NO_x$ Emissions (tonnes/GWh-net, as $NO_2$) | 0.27 | 0.34 | 0.29 | 0.36 | 0.38 |
| **NUMBER OF REPORTABLE SPILLS** | **2008** | **2007** | **2006** | **2005** | **2004** |
| Category A Spills | 0 | 0 | 0 | 0 | 0 |
| Category B Spills | 0 | 2 | 0 | 0 | 1 |
| Category C Spills | 10 | 6 | 14 | 17 | 14 |
| Category D Spills | 5 | 22 | 29 | 12 | NR |

NR = not reported in given year

## Indicator

| PCB MANAGEMENT (tonnes) | 2008 | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|---|
| High Level PCB material in storage | 7 | 7 | 3 | 1 | 2 |
| High Level PCB materials sent for destruction | 9 | 18 | 326 | 97 | 135 |
| Estimated inventory of High-Level PCB material in service* | 41 | 42 | 56 | 411 | 449 |
| Low-Level PCB materials in storage | 9 | 3 | 2 | 2 | 0.4 |
| Low-Level PCB material sent for destruction | 11 | 25 | 6 | 74 | 38 |
| Estimated inventory of Low-Level PCB material in service | 12 | 5 | 3 | 2.6 | 4.4 |
| Total Year-End Inventory (waste in storage + in-service equipment) | 70 | 50 | 65 | 417 | 456 |
| Total PCB material sent for destruction | 20 | 43 | 332 | 171 | 172 |

*Excludes in-service high-level PCB equipment at Bruce Power included in previous SD Report inventories

| RADIOACTIVE WASTE MANAGEMENT | 2008 | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|---|
| Used fuel - annual production (tonnes of uranium) | 1,354 | 1,326 | 1,409 | 1,290 | 1,216 |
| Used fuel in Storage (tonnes of uranium) | 34,783 | 33,713 | 32,302 | 30,862 | 29,667 |
| Low and Intermediate Radioactive Waste produced ($m^3$) | 2,708 | 3,043 | 3,455 | 5,695 | 4,651 |
| Low and Intermediate Radioactive Waste stored ($m^3$) | 3,568 | 3,530 | 2538 | 2,577 | 1,979 |

| UTILIZATION OF SOLID COMBUSTION BY PRODUCTS | 2008 | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|---|
| Total Ash and Gypsum Produced (tonnes) | 975,213 | 1,183,383 | 1,117,023 | 1,286,980 | 1,175,109 |
| Total Ash and Gypsum Recycled (tonnes) | 615,918 | 760,057 | 746,270 | 801,913 | 865,624 |
| Diversion Rate (%) | 63% | 64% | 67% | 62% | 74% |

| HAZARDOUS WASTE GENERATION | 2008 | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|---|
| Solids (tonnes) | 190 | 338 | 16 | 348 | 645 |
| Liquids (kilolitres) | 2,668 | 2,430 | 2,146 | 1,567 | 2,313 |

| WATER USE (million $m^3$) | 2008 | 2007 | 2006 | 2005 | 2004 |
|---|---|---|---|---|---|
| Turbine flows - hydroelectric stations (total flow) | 503,533 | 424,623 | 450,579 | 440,574 | 486,901 |
| Cooling and service water use (non-consumptive) | 13,807 | 13,702 | 13,264 | 14,192 | 13,716 |

## National Pollution Release Inventory (NPRI)

| NPRI Emissions: air, water and land [4] (tonnes unless otherwise specified) | 2007[1] | 2006 | 2005 | 2004 | 2003 |
|---|---|---|---|---|---|
| Aluminum | 393.280 | 307.932 | 343.950 | 286.18 | NR [2] |
| Ammonia | 40.2 | 27.554 | 29.447 | 28.34 | 34.21 |
| Arsenic | 19.075 | 15.625 | 22.638 | 12.41 | 25.27 |
| Benzo(a)anthracene | NR(2) | 0.000 | 0.000 | 0.014 | 15 |
| Benzo(a)phenanthrene | NR(2) | 0.000 | 0.000 | 0.041 | 0 |
| Benzo(a)pyrene | NR(2) | 0.000 | 0.000 | 0.006 | 0.008 |
| Benzo(b)fluoranthene | NR(2) | 0.000 | 0.000 | 0.005 | 0.005 |
| Benzo(e)pyrene | NR(2) | 0.000 | 0.000 | 0.011 | 0.019 |
| Benzo(g,h,i)perylene | NR(2) | 0.000 | 0.000 | 0.010 | 0.011 |
| Benzo(j)fluoranthene | NR(2) | 0.000 | 0.000 | 0.000 | 0.003 |
| Benzo(k)fluoranthene | NR(2) | 0.000 | 0.000 | 0.000 | 0.0 kg |
| Cadmium | 269 kg | 400 kg | 341 kg | 315 kg | 10.2 kg |
| Chromium | 44.522 | 46.308 | 67.601 | 43.90 | 84.42 |
| Cobalt | 21.501 | 7.81 | 10.135 | 2.13 | 25.55 |
| Copper | 77.625 | 62.3 | 73.245 | 45.16 | 89.99 |
| Dibenz(a,h)anthracene | NR(2) | 0.000 | 0.000 | 0.002 | 0 |
| Dibenz(a,j)acridine | NR(2) | 0.000 | 0.000 | 0.005 | 0 |
| Dibenzo(a,i)pyrene | NR(2) | 0 | 0 | 0 | 0 |
| Dioxins & Furans | 1.603 g TEQ(3) | 1.042 g TEQ [3] | 1.642 g TEQ [3] | 3.13 g TEQ [3] | 1.31 g TEQ [3] |
| 7H-Dibenzo(c,g)carbazole | NR(2) | 3.1 | 0.004 | 0.003 | 0 |
| Fluoranthene | NR(2) | 1.200 | 1.547 | 0.010 | 0.018 |
| HCFC-22 | NR(2) | 0 | 0 | 0 | 0 |
| Hexachlorobenzene | 0.042 grams | 0.103 grams | 6.86 grams | 197.20 grams | 33.39 grams |
| Hydrazine | 1.096 | 0.881 | 1.039 | 0.942 | 0.98 |
| Hydrochloric Acid | 3,142 | 2,308 | 2845.693 | 5037.46 | 4871.07 |
| Hydrogen Fluoride | 342.0 | 308 | 345.7 | 403.9 | 538.65 |
| Indeno(1,2,3-cd)pyrene | NR(2) | 0 | 0 | 0.001 | 0 |
| Lead | 27.47 | 20.33 | 0.00 | 15.87 | 28.15 |
| Manganese | 76.13 | 67.20 | 99.62 | 59.32 | 147.98 |
| Mercury | 516 kg | 445 kg | 550 kg | 476 kg | 883 kg |
| Nickel | 51.495 | 36.881 | 49.038 | 27.624 | 55.82 |
| n-Hexane | NR(2) | 0 | 0 | 0 | 0 |
| Perylene | NR(2) | 0 kg | 8 kg | 0 kg | 5 kg |
| Phenanthrene | NR(2) | 0.005 | 0.008 | 0.106 | 0.132 |
| Phosphorus | 912 | 992 | 574 | 349 | NR [2] |
| Pyrene | NR(2) | 1.100 | 0.001 | 0.015 | 0.022 |
| Selenium | 8.9 | 7.6 | 9.285 | 5.15 | 15.26 |
| Sulphuric Acid | 493.131 | 222.594 | 289.474 | 4.972 | 728.44 |
| Vanadium | 102.1 | 79.4 | 107.2 | 64.79 | 149.46 |
| Zinc | 67.000 | 58.900 | 80.922 | 46.95 | 71.94 |

| Criteria Air Contaminants (tonnes) | 2007[1] | 2006 | 2005 | 2004 | 2003 |
|---|---|---|---|---|---|
| Carbon Monoxide | 10,817.00 | 8,163.00 | 12,267.66 | 11,407.96 | 13,263.45 |
| Oxides of Nitrogen (as $NO_2$) | 35,363.00 | 30,841.00 | 39,780.32 | 40,617.94 | 59,159.19 |
| PM - Total Particulate Matter | 7,776.06 | 8,259.56 | 10,421.67 | 8,696.56 | 12,130.13 |
| PM10 - particulate matter ≤ 10µ [5] | 4,179.45 | 3,750.55 | 4,665.46 | 5,801.61 | 8,090.62 |
| PM2.5 - particulate matter ≤ 2.5 µ [5] | 1,586.56 | 1,295.96 | 1,603.94 | 2,376.28 | 3,308.87 |
| Sulphur Dioxide | 104,647.65 | 87,275.59 | 113,645.3 | 116,979.3 | 157,805.7 |
| Volatile Organic Compounds (VOCs) | 166.00 | 376.00 | 437.85 | 387.88 | 537.09 |

(1) Year 2008 data was not available at the time of publishing.
(2) NR = not reported in given year
(3) g TEQ = grams Toxic Equivalent
(4) For detailed information on the breakdown of OPG's NPRI data by emissions to air, water, and land please visit the NPRI web site at **http://www.ec.gc.ca/pdb/npri/npri_home_e.cfm**
(5) µ = microns (particle diameter)

# Environmental Policy

## Environmental Policy

**Effective:** May 10, 2006

**Policy Statement:** OPG will strive to continually improve its environmental performance by committing to the following seven requirements:

**Requirements:**

- **Meet or Exceed Legal Requirements**: Meet all legal requirements and OPG's voluntary commitments, with the objective of exceeding those standards where appropriate and feasible.
- **Advance Environmental Stewardship**: Contribute to environmental protection, pollution prevention and energy and resource use efficiency.
- **Maintain ISO 14001 System**: Maintain registrations to the International Organization for Standardization (ISO) 14001: 2004 Environmental Management System.
- **Integrate Environment in Decision-Making**: Integrate environmental factors and stakeholder considerations into our planning, decision-making and business practices.
- **Engage Employees**: Engage and educate employees to conduct their activities in a manner that respects and protects the environment.
- **Contribute to Our Communities**: Contribute to and enhance the environmental well-being of the communities in which we operate and the broader public who grant us our license to operate.
- **Communicate**: Measure and publicly communicate our environmental performance with employees, governments, local communities, contractors and other stakeholders.

This Environmental Policy is an important part of OPG's commitment to Sustainable Development.

**Accountabilities:** The President and CEO is accountable for this Policy.

The Vice President Sustainable Development is accountable for monitoring and reporting regularly to the Executive and Board on OPG's environmental performance and progress in implementing this Policy, including immediate notification of a Significant Environmental Event.

The Business Unit leaders are accountable for environmental performance and compliance within their Business Unit.

All employees have accountability for protecting the environment and for complying with this Policy.

**Sponsoring Unit:**
Vice President Sustainable Development

**Approval**: Board of Directors
**Date**: May 10, 2006

We welcome any comments or questions you may have. Please call:

Vice President, Sustainable Development at 1-416-592-6844, or e-mail us at webmaster@opg.com

Our mailing address is:
Ontario Power Generation,
700 University Avenue,
Toronto, Ontario, M5G 1X6

Visit our Web site at **www.opg.com**

2008 Sustainable Development Report

ONTARIOPOWER GENERATION